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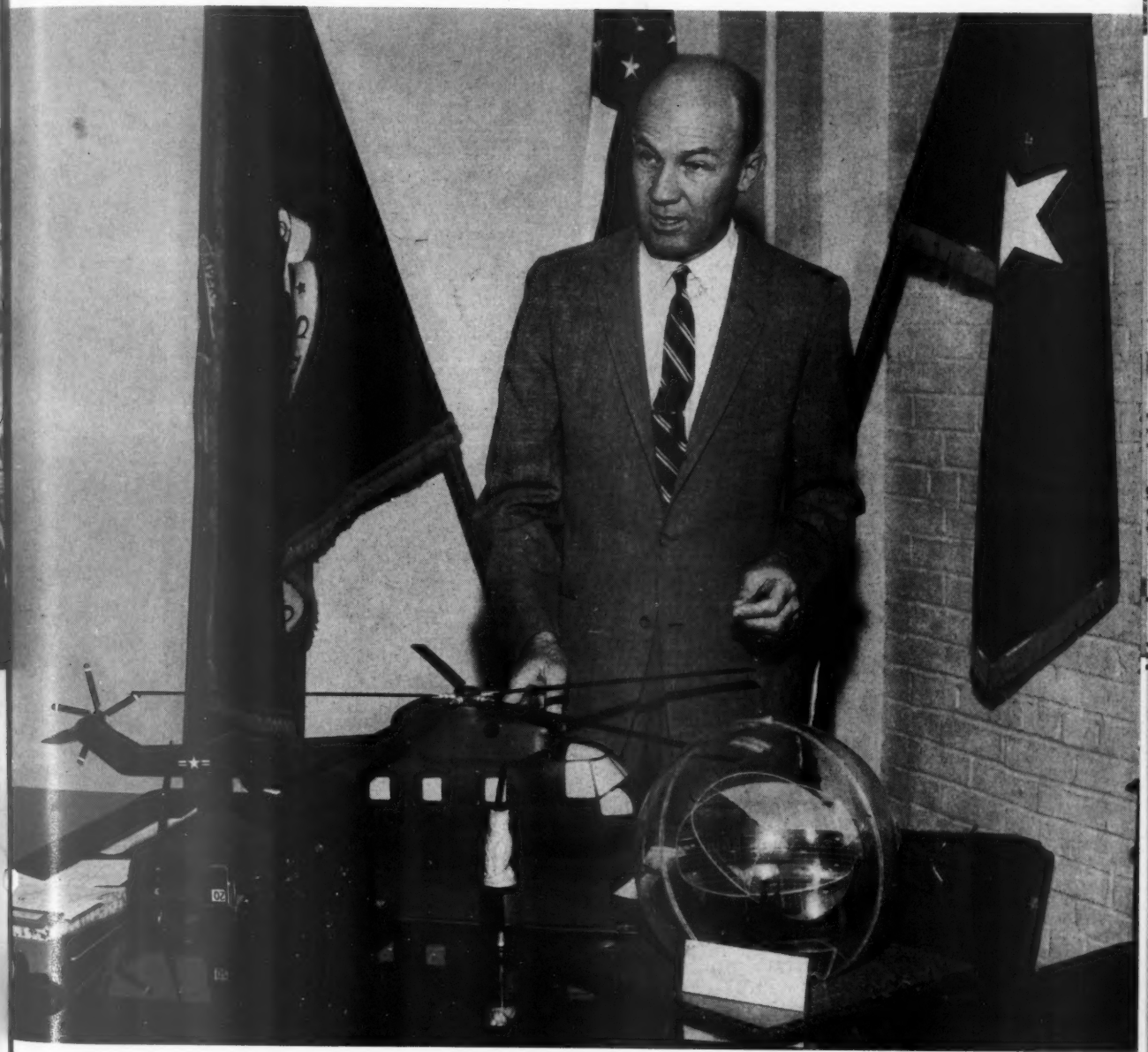

Marine Corps' Gen. Hochmuth . . .

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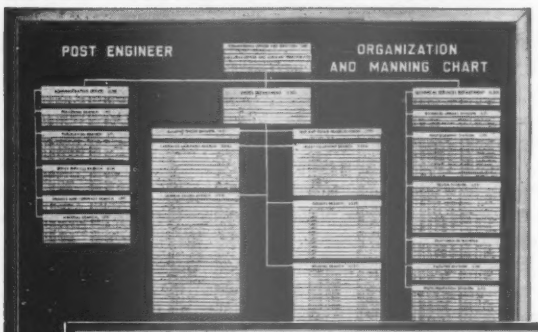

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APRIL, 1960

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FEATURES

DEPARTMENTS

FEATURED NEXT MONTH

Industrial Security: What are We Trying to Protect? . . . A Team Approach to Pricing . . . Today's Military Strategy: Part III

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The GAO: What Price A Headline?

FORTUNATELY for the cause of "peace in our time" military contracting officers and defense contractors may not organize their own combat units.

If they could, the next limited war would almost certainly break out somewhere in the vicinity of GAO headquarters at 441 G Street, N.W., in the District of Columbia.

It is one of the worst kept secrets of Washington intramural relations that most contract negotiators waste few kind words on the General Accounting Office. GAO's strange, but highly successful, presentations to Congress recently are a classic example of what can happen when authority is granted (or usurped) minus the necessary burden of responsibility for the result of its use. In essence: GAO does not and need not bother analyzing the impact of what they do on the organizations they dissect.

An independent audit of how they spend the Defense Department's money and how well they stack up against what might have been done—a look at the total picture with a criticism of the total outcome—would be a valuable tool to the men responsible for buying the hardware of war, and a tool they would like very much to have. Unfortunately, GAO apparently prefers to look at extremes (even in interpreting their own reports), twist and puff them into something out of all relation to their original environment.

GAO's efforts to improve defense buying practices have taken such inspiring forms as setting up that idiotic child's game whose script is the ridiculous "Certificate of Current Pricing Data," subtitled (unofficially), from the play of the same name: "Tell Me Your Telling Me The Truth."

Such GAO shenanigans force thoughtful sideline observers to assume either (1) GAO has an appalling lack of knowledge about how defense contracting is handled—which seriously questions their credentials to do an audit of it; or (2) They are playing to the gallery rather than performing as their job description says they should.

But if GAO's peripatetic pathology over the past eighteen months has generated a particularly misleading and obnoxious odor, defense top management's reaction, in some cases, has been just as bad, has amounted in fact to an over-reaction likely to create problems far worse than the bulk of the garbage being shoveled out by GAO.

Example: in a few defense offices lately there has been conversation about creating what, for want of a better name, we will call a pre-negotiation clearance.

Under this clearance process, the negotiator (and the rest of the negotiating team too) is suddenly being told that his skills must be double checked and approved *before they are even exercised.* He must outline for some nebulous high authority, at least one step divorced from the negotiation itself, what he intends to do and how he intends to do it and why. This is all right, probably, since most of the top notch negotiators plot a course of action beforehand, anyway.

But now the hooker: if the negotiator, for instance, runs into some unforeseen twist in the negotiation, which happens frequently, it may necessitate altering his plan of attack slightly or considerably. If the proposers of this clearance business have their way, he will no longer be able to make an immediate decision and permit the negotiations to continue smoothly. He will have to check for approval first to change his plan.

This clearance of the nit-pick is even more ridiculous with the auditor. Auditing is supposed to be an analysis of historical data. Now, say the sensitive souls who dreamed up this idea, auditing will be, in effect, an after-the-fact check of a future prediction—in some cases on figures which won't even be firm for five years. Realistically, such a chore can't amount to anything more than a re-computation of the arithmetic, a task any high school student could manage with fair alacrity and a good deal less expense.

One predictably discouraging result: defense contractors, who have long complained about the difficulty of finding a man in defense with the power to make a decision, are likely to find it virtually impossible soon—at least in a few areas. The contract negotiator, upon whom they could once depend for answers, will be able to give them only a tentative decision at best.

Another result: the negotiators themselves say simply "We just won't be able to do a better job." And as far as decision making is concerned, the defense contractor probably won't get any decision at all from negotiators. Summing up the feeling: "Why should I stick my neck out? I might as well get the answer from the boss first before I say anything to anybody."

Thus, what was a key and constantly improving element in defense spending of several billion dollars is in danger of becoming little more than a group of message carriers. A regular rabbit warren of complex negotiating maneuvers is likely to develop over and above what already exists—which is bad enough. The time consumed in setting up contracts threatens to stretch beyond all reasonable lengths and the cost of the operation will go up, up, up.

That GAO should have become a short-sighted tyrant flailing its "economy" club in mis-directed glee is possibly understandable—and defense, which has been unjustifiably censured before and will be again, can compensate for that.

But, that some defense top management threatens to weaken the effectiveness of their own outfits by over-reacting to this political clap-trap is inexcusable.

Bill Borklund

Washington Background

IMPLICATIONS ON HARDWARE PROGRAMS in military are just now being realized by participants in significant debate over military strategy. (Debate details are being outlined in AFM 3-part series which began with March issue.) If "counter military force" advocates win out over present "counter nation" front runners, a Polaris submarine fleet would provide all the long-range missiles for firing at fixed targets (in 1963) that U.S. would need.

EMPHASIS WOULD, OR SHOULD, then be switched (decision must come now to be really effective) to ANP program, revival of something like the F-108, advances in the VTOL field (which has been largely cancelled), and a far bigger role in strategic defense for greatly modernized forces at sea. Among currently "average" programs which would jump to the top of the heap overnight—long-range reconnaissance and communications backed up by greatly improved data processing gear to handle information instantaneously and automatically, a realistic Civil Defense program.

OUTSIDE OF THE ADMINISTRATION ITSELF, expanding group of Washington observers sees no reason for separating U.S. space research into arbitrary civilian and military categories. (National strategy debate has implications here, too.) But, while they agree in theory there should be a single manager, critics can't get together on whether it should be civilian (NASA) or military.

SOME NAVY CIRCLES ARE GROWING considerably disgruntled over cool reception (compared to technical progress) being given Polaris. Special Projects Office, however, has "no comment." Conservatism is coming from roadblock authority with less-than-complete knowledge of weapon system's status.

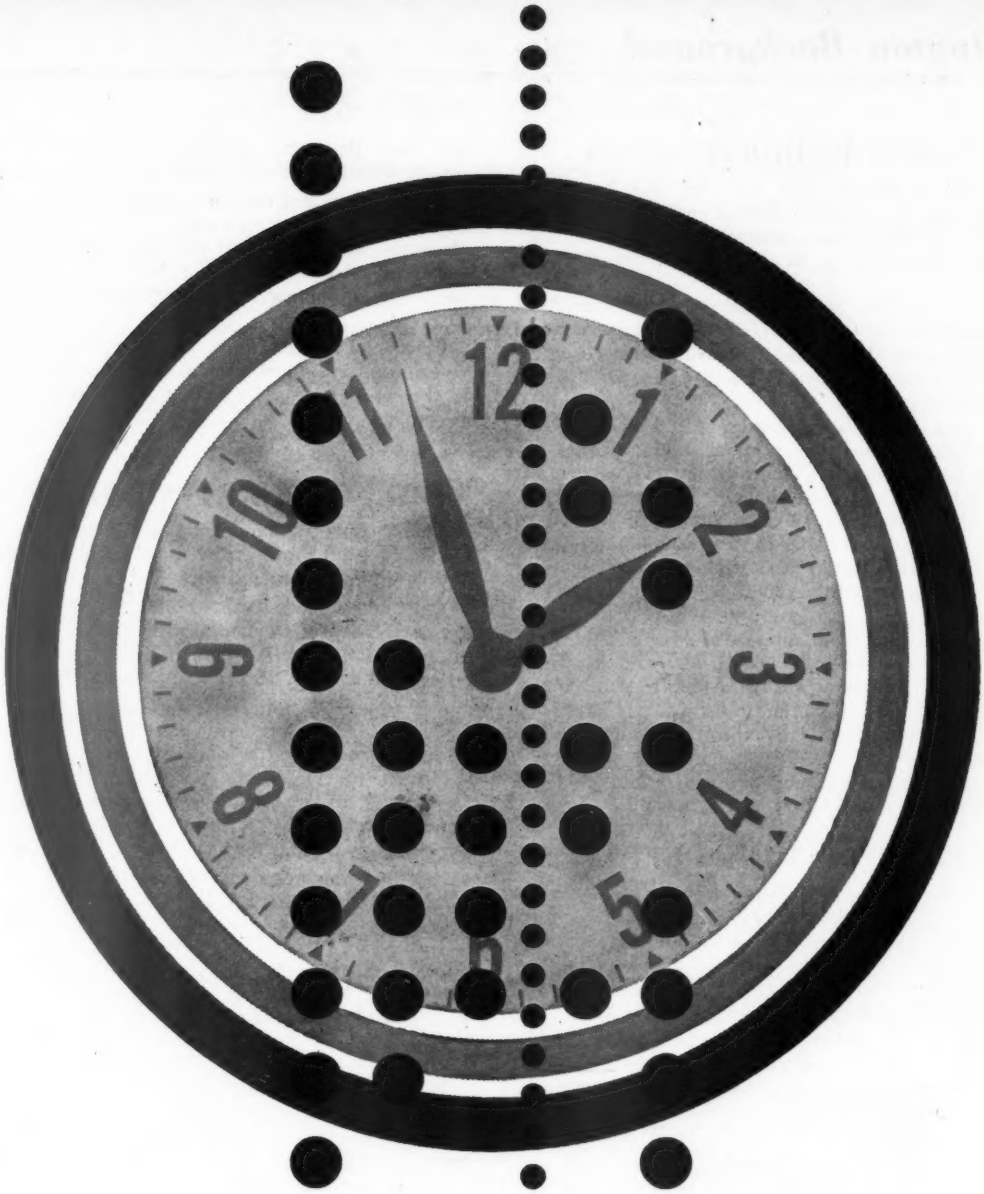
ITEM: EVEN WHILE "GO SLOW" decisions are being made elsewhere, Navy could conceivably revise delivery schedules once more—from current plan to be operational this fall. "Yes" or "No" answers will come from tests being run this month.

SPO BOSS, ADM. RABORN, has not been swept away by the "show them" talk, is insisting on an orderly, even though urgent, development. The analogy: "Like football's Statue of Liberty play, it's great if it works, sets you way back if it doesn't." He points out, too, that team has already cut 3 years off the originally planned 7-year development, sees trying to pick up another 4 months as not worth the gamble—if April tests indicate it would be a long shot.

MILITARY AIR TRANSPORT SERVICE seems finally to be making headway, at least in some parts of the Washington arena, in its battle to grow strong enough to carry out its wartime mission. MATS' opponents have been publicly elated over claimed gains in Congress' debate about "duplication of commercial routes and services."

THE LESS WIDELY PUBLICIZED MATS statements to Congress have not backed off an inch from MATS' arguments of a year ago, are being more strongly supported in the Pentagon, listened to more closely on Capitol Hill. One significant reason: the irrefutable strengths and weaknesses, long insisted on by MATS, which came to light in last month's Big Slam exercise in Puerto Rico.

DEFENSE SECRETARY GATES and the Joint Chiefs of Staff are reportedly "very pleased" with "how successful" Gates' regular attendance (each Monday afternoon) at JCS meetings has been working. Decision making has speeded up, paperwork headache eased. Chiefs individually have told Gates they "like this way of doing business."



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are essential to missile development. Instruments must record every function against time... in fractions often finer than one ten-thousandth of a second. Reams of electronic and optical data must be collected, reduced and evaluated before any missile can become operational. Vitro designed, built and helped instrument the Air Force missile test center at Eglin Air Force Base, Florida. Today it operates the center's test ranges and tracking stations throughout the Southeast. At Eglin, Vitro and the Air Force, working as a team since 1952, are responsible for checkout of missiles, rockets, weapon systems, countermeasures, space probe vehicles and bombing techniques. Beyond this Florida site, other Vitro capabilities: underwater (torpedo) and electronic environmental ranges.

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MATS URGES MODERNIZATION

Procurement of 94 swingtail jets and 188 "workhorse aircraft," costing about $250-million a year for eight years, would be the backbone of a Military Air Transport Service modernization program as proposed to Congress last month.

Testifying before the House Appropriations Committee, MATS Commander Lt. Gen. William H. Tunner outlined the following needs: (1) a plane for moving outsized cargo; (2) a "modest number" of fast reaction planes; and (3) an "austere workhorse" plane.

Shortly after Tunner's testimony, Air Force released partial specifications for an "optimum military cargo aircraft" to be developed jointly with commercial carriers for use by both MATS and the airlines.

Such a plane would carry a maximum of 70,000 to 80,000 lbs., and would be able to haul a minimum 40,000 lbs. on trans-atlantic nonstop lifts. Minimum cruising speed would be 440 knots with a 5000 ft. maximum runway needed.

Coming to the immediate support of MATS' needs was Sen. A. S. Mike Monroney (D-Okla.) who said he would push for a 100% increase in MATS' modernization request. Since MATS is asking $50-million in fiscal 1961, Monroney is advocating a $100-million modernization budget for the Air Force agency.

As has been true in the past the MATS proposals will probably meet heavy opposition on Capitol Hill.

EX-CONTRACTOR HITS DEFENSE

Sharp criticism of Administration defense policies was leveled last month by Thomas G. Lanphier, Jr., resigned vice president of Convair division of General Dynamics.

Citing an "unwarranted risk" in today's defense policies, Lanphier called for an estimated $4-to-5-billion annual increase in defense spending over the next five years.

Questioned on Lanphier's charges, Defense Secretary Thomas Gates told a Pentagon press conference "I don't agree with him and I don't think very many other people do." Gates added that it seemed Lanphier thought "he knew more about the whole thing than the President did."

Among the proposals for improved defense made by Lanphier were: (1) a substantial SAC airborne alert; (2) acceleration of Atlas and Titan ICBMs; (3) acceleration of Polaris and Minuteman mobile systems; (4) a speedup of early-warning satellites, Midas and Samos; (5) purchase of Army and Marine airlift; (6) and a start on a sensible civilian shelter program.

Lanphier resigned from his job at Convair specifically to campaign for better U.S. defense. Speculation in Washington is that Lanphier's resignation was politically motivated, perhaps in support of Presidential-hopeful Stuart Symington.

ARMY WANTS MORE AIRLIFT

The existing military transport fleet is inadequate for critical movement of Army forces, according to Gen. Lyman L. Lemnitzer, Army Chief of Staff. Army Secretary Wilber M. Brucker has also told Congress that he was "uneasy" about the present airlift situation.

Lemnitzer told House Armed Services investigators that "ideally, we would like to see new types of aircraft developed and procured which are better tailored to meet our need than the types now available. However, we cannot afford the delay which this would involve."

Pointing out that the present arrangement with the Civil Reserve Air Fleet is not adequate for use in limited war situations, Lemnitzer told the House probers that Army's plans call for ability to move two reinforced battle groups and their equipment to any hot spot in the world within hours.

Further, Lemnitzer said he desired airlift to build up to full division force within days, and increase the size of the fighting force to two divisions within two to four weeks.

MORE A-ROCKET FUNDS

Atomic Energy Commission has restored $11-million to the budget of Project Rover, to accelerate development of that nuclear powered rocket.

With the added funds, Project Rover officials believe that feasibility of the atomic rocket can be demonstrated by 1963. Before 1970, they believe a nuclear rocket can be built that will send a manned expedition on a round trip to the moon.

The restoration of funds offsets cuts proposed by the Budget Bureau for the coming year. In order to provide the funds for Project Rover, Atomic Energy Commission was forced to cut other programs under its aegis. Besides funding problems, Congressional leaders have questioned the efficiency of split responsibility on Project Rover.

Presently this responsibility is split between AEC and National Aeronautics and Space Administration.

ASW PAYOFF SOON?

More rays of sunshine spring over the horizon in Navy's efforts to jack up its anti-submarine capability to something approaching the challenge of the nuclear submarine.

In the past year unification of operations at sea has made giant strides, even though (and maybe this is just the nature of the beast) fleet's standard complaint is that the new equipment isn't getting to them fast enough and in sufficient quantity. Then too, technology is considerably more advanced than it was 12-18 months back.

Example: although even submariner opinion is divided on whether this is a significant advance, over the 13 Thresher class subs authorized or under construction, Navy will launch, this month, the $43-million, nuclear-powered Tullibee. Designed specifically for ASW, it is, said one admiral, a "major advancement in ASW weapons development."

Another bouquet: the National Security Industrial Association's 3-volume ASW status report due out in mid-April. Unclassified report tends to refute contentions which have appeared in this magazine, says, in essence, "all things considered, effort to solve the problem is moving well." Report has been labelled "an excellent review job" in some Navy circles.

Only mystery: AFM and NSIA were gathering their information at about the same time from many of the same sources. Why are conclusions exactly the opposite, particularly in the "unifying of control and singling up of effort" field? Answers may come at two-day classified Navy-sponsored ASW symposium in Washington April 20 & 21.

WHO TOOK THE DIESEL ENGINE OFF ITS HEAVY FOUNDATION?

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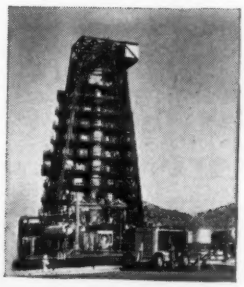

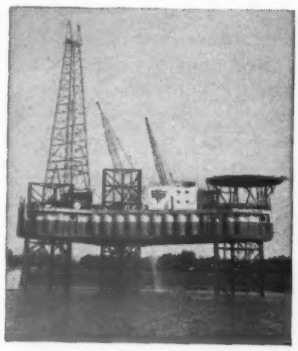

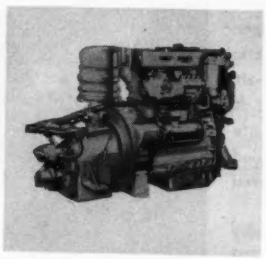

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And evolution is still going on. An even more advanced Thunderbird is well under way. Employing advanced techniques and retaining its full mobility, the new version will, among other things, provide increased low-level capability and increased range.

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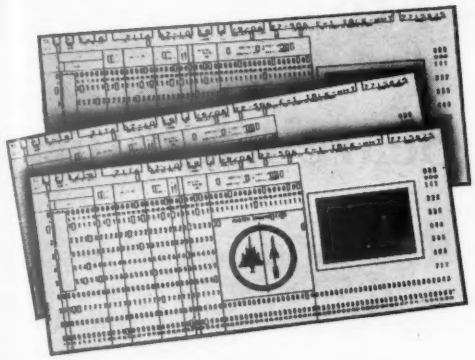

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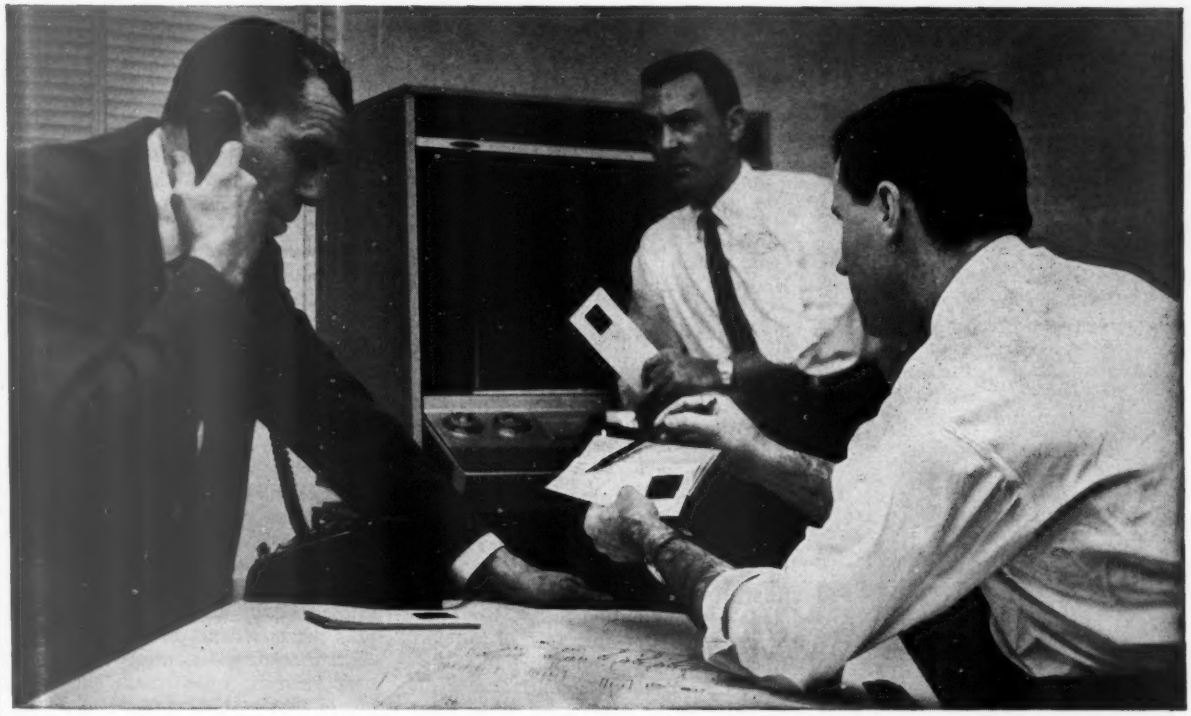

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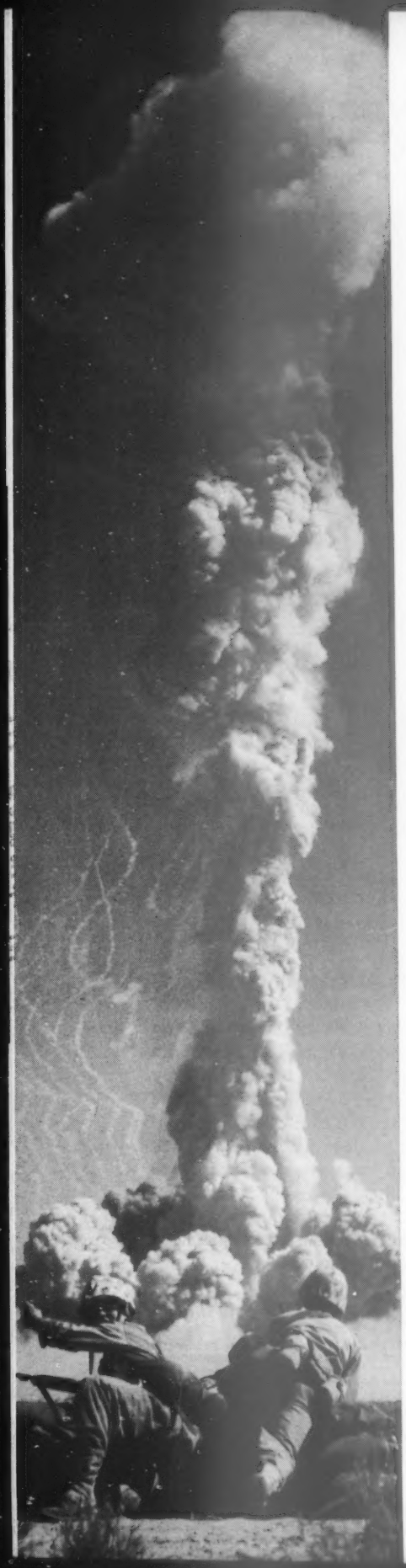

Marine Corps R&D

The Search for Ideas—A

With little or no formal organization of their own for new weapons development, the Marine Corps has had to make the best of a makeshift, hand-me-down sort of an operation, getting bits and pieces where. and w spite o

by Fred Hamlin

SOMETHING BETWEEN 80% and 90% of the existing Marine Corps manpower are combat troops, assigned to combat units, and ready to move to just about anywhere in the world—if they aren't already there—in a matter of hours.

According to Army Chief of Staff Gen. Lyman L. Lemnitzer, before the House Defense Appropriations Subcommittee, Army's "category of operating forces includes the combat forces, and that figure is 65.8% of our total in operating forces . . . I should point out this is the highest proportion that the Army has ever been able to move into the operating force category."

There is, of course, a reason for what seems to be a glaring descrepancy in the Army's ability to muster combat troops. Almost to the decimal point, the difference in the two figures stems from Army's maintaining just about all of its own supporting forces, while the Marines rely for this sort of support on a multitude of outside sources.

In theory, the system is excellent. It provides the Marines with what would otherwise be an intolerable drain on its manpower, and a financial outlay that in today's market would be simply out of the question. The history of this way of doing business dates back some 180 years, from the time the Marines were first set up under the Navy. It successfully has proven itself throughout the history of the Corps, and as recently as Korea, Gen. Lemnitzer was able to report to this year's Congress that "I had the 1st Marine Division adjacent to my own up in the high mountains of Korea, (they relied) on this Army support system to provide the ammunition, the fuel, the food, the transportation and all the other support."

But since the Korean war, a virtual revolution has taken place in land or limited warfare. For the first time in the history of the world, this nation has been allowing it's military forces budgets that amount to near-wartime levels. The use of helicopters as attack vehicles, the concept of vertical envelopment, battle field missiles, high speed communications, greatly expanded battlefields resulting from the possible use of tactical nuclear weapons—all have forced U.S. ground forces to face up to a rushing technology, a technology that has dictated revolutionary changes in tactics and battelfield strategy, and one that has literally rammed specialization down the throat of the combat soldier, regardless of the military branch he serves.

One combat soldier armed with the nuclear-tipped Red Eye missile probably controls about as much fire power in his one-shot weapon as an entire World War II infantry company could muster. One single ultra-complex communications switching station can control just about any size battle group up to a division—and must obviously be manned by absolute specialists.

As the men who use the equipment must specialize, so must the equipment itself be specialized. The single missile that costs, for instance, in the neighborhood of $50,000 per copy must be ideally suited to the buyer's needs, or the price is prohibitive.

The above described situation is one that could be pushing the Marine Corps into a tight and nasty corner. Because they have no organization close to what is needed to provide the sort of new equipment development they require, the Marines, like the man in the song when the well runs dry, "have to make do with gin."

Although both Army and the Navy are cooperating to the utmost in giving the Marine Corps what it wants, there is the ever-present tight money situation, coupled with the absolutely precise knowledge of Marine Corps needs that can come only from a Marine. Through no fault of their own, the supporters of the Marine Corps are, in many cases, hamstrung both on priorities and the immediate needs of their own services.

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pieces of new equipment from just about everywhere. This is what's wrong with the system, and what the Marines have been able to do in spite of it . . .

For the Marines, the result has been something of a hodge-podge of equipment buying. To get what they have wanted in equipment recently, the Marines have had to hop-scotch from France, to Italy, to Germany, hitting such old-line Army outfits as the Springfield Arsenal en route, along with much help from industry and the Navy.

With a mission—and an organization—like no other service, the Marines are faced with perhaps more specialized requirements of varying natures than any other service. The very first premise of Marine operations —that they be conducted on an amphibious basis—is one which forces an immense amount of specialization. In a pinch, the Army can generally walk to where it wants to go: from landing craft to beachhead can be a long, wet stroll.

"We have very few people who work full time on our research and development programs. On the other hand, there are many people throughout the Corps who work on this sort of thing on a part time basis." So says Brig. Gen. B. A. Hochmuth, Deputy Chief of Staff for Marine Research and Development.

The gathering point for most of the ideas that are generated for new equipment throughout—and outside of—the Marine Corps is at the Marine Corps Landing Force Development Center, Quantico, Va. Again quoting Gen. Hochmuth, "actually, only about half of the work that they do is on Marine Corps development work as such. The rest of the time is spent testing ideas that come in from the outside."

The outside help that the Marine Corps gets comes from just about everywhere. With ONR, the hottest Marine-oriented project is probably the air-cushion method of flight propulsion, offering Marines the ship-to-shore speeds dictated by the possible use of tactical nuclear weapons. One foreign firm has developed a cushion-vehicle that will move up to 50 mph, hauling a payload of some 3000 lbs.

From the Army, the Marines have been able to get the majority of the development work on the recently-announced 115-mm rocket boosted artillery weapon. Also from the Army development factory have come such weapons as Hawk, Davy Crockett, and the M-14 rifle. As a measure of the cooperation between these two services, Marines will be fully equipped with the M-14 before the Army will.

Far from confining their search for new equipment to this country, the Marines are looking literally all over the world. From the French came the SS-10 and SS-11 anti-tank missiles; from the Germans, the Cobra man-carryable anti-tank missile; and from the Italians, a 3000-lb. 105-mm howitzer that looked like it might solve many of the Marines' mobility problems. While not all of these systems have found their way into the Marines' inventory, all were considered, and are indicative of the lengths the Marines will go to find a piece of combat equipment that will help them out.

Which is not to say that the system is infallible. Of the 150-200 projects that are usually under review at MCLFDC, there are inevitably a few that do not meet the specialized needs of the Marine Corps—Lacrosse, Little John and Dart are three recent examples.

The obvious answer to all of the Marine Corps problems would seem to be setting up their own supporting force, but this, to understate it, is most unlikely. Comments Gen. Hochmuth: "A lot of people would like to get rid of their 1956 Chevvies and get 1960 Cadillacs. But if the Chevvy runs, it's not necessarily the wisest move. And of course you have to consider the cost of the Cadillac."

The "cost of the Cadillac" in the case of the Marine Corps would most accurately be measured in terms of manpower. To support its own R&D programs in their entirety would take a tremendous workforce. And even given the high rate of combat personnel throughout the Corps, Gen. Shoup told Congress this year that "The percentage of our three division-wing teams that may simultaneously be committed to combat and the location, intensity, and duration of the conflict could be such as to properly require a ready Marine Corps of 200,000, 215,000, 234,000, or even more."

What the Marine position boils down to is this: while it would be a great deal of help in some areas to be able to do its own work, the price that would have to be paid is prohibitive. In spending the time that it does in looking over just about everything that comes along, Marine Corps is able to pretty well glean what it needs without having to support the extra expense.

And in doing it this way—particularly in the area of aircraft, the Marine Corps can pick up considerable fringe benefits in its procurement and maintenance work. On the new twin-turbine HSS-2 helicopter for example, Gen. Hochmuth frankly admits "we couldn't have afforded the development cost ourselves." But when the Navy bought the HSS-2 in a subhunting configuration, it was only a matter of minor modifications to convert the rotary wing craft to Marine-assault characteristics.

And because the helicopter is in the Navy inventory, the Marines are only as far away from maintenance depots as the nearest depot maintained by Navy throughout its world-wide support system.

If on the surface the Marine way of doing its development work is one which appears a bit haphazard, the results are just about undisputed. To be able to support the only force in the Defense establishment which must work with its own tactical air arm, operate equally well on land, water, or in the air, and at the same time maintain a combat force comprising between 80% and 90% of its total strength is certainly a tribute to the system, and the kind of results that are generated by it.

Part II

Today's Military Strategy:

Is It National Suicide?

IN BRIEF: ***Last month, AFM outlined the reasoning behind the most significant, and least publicized, debate going on in the Pentagon today. Military critics of U.S. efforts to build a strategic deterrent force are saying, essentially: "During the past five or six years, massive retaliation has been corrupted to mean the wanton destruction of Soviet cities and people. Its goal—utter devastation of Russia. Its motive—an irrational urge for revenge. Its price—guaranteed national suicide."***

The thinking behind this contention, boiled down: the military force now a-building will not be capable of defeating the enemy's military, but merely of striking back in a hopeless, vengeful gesture of genocide. This second article expands on the universally accepted military principle (which our policy makers have temporarily lost sight of) that the primary purpose of a military force is the destruction of the opposing military force.

Among the points: we are expecting too much from the ICBM; an airborne alert force would be militarily insignificant and probably cause more American casualties than Russian.

Underlying the whole debate: much inconclusive argument can be tossed around about the relative merits of specific pieces of hardware 'vis a vis the Soviets' similar equipment. But if the Russians some two year's in the rear today overtake and surpass us in far-sighted, comprehensive strategic planning, we will be guaranteed absolutely an inferior military position.

by Bill Borklund

Based on new views emerging in some Defense Department circles

THE peace of the past decade has been sustained by an unquestionably superior U.S. strategic offensive capability. Russian advances in technology have destroyed all hope of continuing to maintain an overwhelming strategic force. But our policy makers have gone much too far in their new contention that our offensive capability need no longer be superior or even equal to that of the Russians.

The confusion that has arisen from various analyses of our complex national defense problem has been neatly stated by Dr. Morgenstern*:

"In this time of peril we find distressing confusion wherever we look: one day we are assured that this country is so strong that no one will dare to attack it; the next day we are told that we are in mortal danger. Some of our military and political leaders tell us that the plans and provisions to cope with hostile intents are entirely satisfactory; others, equally competent and also highly placed, deny this vigorously.

"The system of defense has become so complicated and involved that even some of those who make it their profession to study it become confused and cannot evaluate our strength in the light of the capabilities of the enemy. The power to participate in any detail in the processes of political and military decision vanishes to practically zero for the ordinary citizen, a serious matter for the survival of a living and meaningful democracy. *The complicated nature of the defense organization also gives rise to the familiar belief that anything so complicated must certainly have been thought out carefully, a view that is nurtured by whoever is in charge of the establishment.*" (Italics supplied)

The current controversy clearly recognizes the fundamental issue—do we have now, and will we continue to have in the immediate future, a military force capable of protecting us and our vital interests? Although the majority of judgments on the "Defense Debate" are based on an agreed body of facts, the meanings and implications, the conclusions and suggested future actions vary widely.

The most crucial tenet of our current defense doctrine is the assumption that military force can be applied to our advantage against Russian people and cities. From a practical military viewpoint, it is discouraging to hear our governmental spokesmen say that after a Russian surprise attack we intend to employ what nuclear power we might have left to "devastate" Russia.

If we intend to ignore the remaining Soviet military capability and ex-

*Oskar Morgenstern, "National Defense," Random House, New York, 1959.

pend our surviving weapons against Russian cities, we have without question, lost the war. Why? Because we would be dominated by the remaining Russian strategic forces which we had neglected to destroy when we chose to concentrate on futile vengeance against cities and people.

If we do not employ our "minimum deterrent" forces against Russian forces, then ultimately we must surrender. Our inferior force will face a militarily hopeless situation. Whether or not we employ a truly inferior force (or choose not to employ it) the result is inevitably our own defeat.

This, then, is the fallacy of "minimum deterrence" and of "retaliation" if deterrence fails. A "minimum deterrent" force used against superior enemy forces will bring only defeat; used against other targets such a force can bring only our own destruction.

Suggestions that we use the threat of "retaliation" for protection of other Free World countries are less frequently heard these days. The reason for this sudden loss of confidence is clear. A policy of retaliation with, at best, equal forces, such as we are planning today, can scarcely protect even the United States itself from attack. It offers no real protection for the allies who were secure under the wing of superior forces.

IN order that we may build a military force which is not an instrument of suicide, that is credible, and can protect our Free World neighbors, we must once again recognize that the primary purpose of a military force is the destruction of opposing military force.

The great defense debate going on today has centered on the "missile gap." Some critics of our present policy argue a "missile gap" is intolerable. Defenders of present policies argue that "a missile gap is not a deterrent gap" since our "deterrent" is the sum of all of our military forces. So much fervor has been generated over how many ICBM's we should have on a certain "critical" date that the fundamental issue of whether the ICBM will be the decisive strategic weapon at all has been ignored.

a) *Will we employ our ICBM's for Suicide or Survival?*

b) *Can ICBM's provide the primary means of defeating Russia if deterrence fails?* At first glance these queries may seem to be only two statements of the same problem. Not so. A review of medium and long-range ballistic missile capabilities and limitations should provide the answers.

The liquid fueled Atlas is our first ICBM. The first few squadrons will be deployed on "soft" (unprotected) sites. Subsequent squadrons will have an increasing degree of hardening to protect them from almost anything but a direct hit or a near miss by a nuclear weapon exploding at surface level.

Another liquid fueled missile, the Titan, will be deployed, eventually, in "hardened" sites. All later Atlases and Titans will be dispersed (separated by some miles) and hardened so that no missile could destroy more than one of them.

The submarine-launched Polaris has a range now of 1200 miles, with 1500 miles expected in the near future. Solid fuel makes this missile less complicated to build and easier to deploy and maintain. By the end of this year, two Polaris submarines will be operational with an "in hull" capacity of 16 missiles each. It has been said that the Navy plans for about 40 submarines.

The Minuteman, a second generation ICBM, is also solid-fueled. It, too, will appear in mobile form—for constant deployment on railroad cars. The mobility inherent in the Polaris and the Minuteman is perhaps the most significant development in ballistic missiles to date and will remain so until much greater mobility is achieved in cruising aircraft.

Placing missiles in submarines, on railroads, on highways, on surface ships or in the air provides them with protection by taking advantage of the gravest weakness of long-range missiles—the almost insurmountable problem of destroying a moving target with them. One must first detect a fleeting, mobile, or moving target, decide that it is worthy of destruction, select the missile to be fired against the target, compute the ballistics, program this data into the missile, and prepare it for firing. Only then can the missile be fired.

Even if all these operations could be performed *instantaneously*, the ICBM still has a flight time of about 30 minutes. Therefore, if the target selected can significantly change its location in something less than 30 minutes, the probability of its destruction is drastically lowered.

Since flight time of an ICBM cannot be appreciably reduced, the weapon is relatively ineffective against mobile targets but extremely effective against fixed targets.

Last month at San Jose, Calif., Admiral Burke had this to say about missile mobility: "Fixed launching platforms in known locations will become more and more vulnerable in the missile era, but it will not happen overnight.

"At the same time mobile launching platforms remain virtually invulnerable. (Admiral Burke obviously meant "virtually invulnerable *to ICBM's*" since mobile targets on sea or land are obviously vulnerable to other weapons such as submarines and aircraft, and to target-seeking missiles fired at short ranges.) The more an aggressor shifts his nuclear weapon capabilities to ballistic missiles the less vulnerable mobile launching platforms become and the more they will be needed."

Mobility is the elementary counter to the ICBM. The mobile Polaris and Minuteman missiles are attractive as weapons because of their decreased vulnerability. Because the mobile ICBM is far less vulnerable to destruction by an opposing ICBM, some other type weapon must be used to destroy it.

As we and the Soviets increase the rate at which military forces incorporate mobility as a defense against ballistic missiles, we will find fewer and fewer purely military strategic targets. Our national acceptance of "devastation," rather than military supremacy, as a legitimate goal therefore must mean firing many of our ICBM's against Russian cities simply because there would be few other worthy fixed targets.

Can the ICBM provide the primary means of dominating Russia if deterrence fails? No. Visualize the situation a couple of years from now when we have the Polaris and the mobile Minuteman in operational quantities and the Russians have similar missiles. Clearly, ICBM's, fixed or mobile, cannot seek out and destroy opposing *mobile* ICBM's. If a majority of the ICBM's on both sides are mobile then the outcome at this point in the conflict is inconclusive. ICBM's, in themselves, can only be "conclusive" when they are employed for mutual devastation of cities.

FOR a less insane type of war, where destruction of the opposing military force (the obvious Russian threat) is the only logical, immediate objective, missiles would form a part, though conceivably not the major part, of our strategic offensive force.

For the foreseeable future only manned aircraft have the inherent characteristics to achieve decision between opposing strategic forces. Today, our manned strategic aircraft are land- or carrier-based. While land-based aircraft are dominated by ICBM's, except when in flight, the carriers are not, except (rarely) when in port. The Strategic Air Command possesses the majority of "ICBM vulnerable" aircraft.

SAC was, and is, the most powerful military force created by man. But after numbers of enemy ICBM's are in place, SAC will be threatened with surprise destruction on the ground. What about airborne alert?

General Power has said that with

Missiles, airplanes and fallacy. . .

300 effective ballistic missiles, of which 150 need be only IRBM's and the other 150 ICBM's Russia could, theoretically, destroy our manned bomber force. It is generally agreed that the Russians do not now have the required 150 ICBM's.

In September of this year, the first of the BMEWS stations is scheduled to be operational, with the second station following shortly thereafter. Assuming we could count on launching 1/3 of this force after a surprise missile launch against us, then the Russian quantitative superiority in ICBM's could become manageable. Whether or not we can count on having 1/3 of our bombers available is dependent upon the effectiveness and dependability of BMEWS and, later MIDAS, the early warning satellite.

Viewed in this manner, the critical period of vulnerability for our strategic forces starts when the Russians first have available 150 ICBM's on launchers, ready for salvo, and ends when we can place complete reliance on BMEWS. The first and second BMEWS stations begin operation in less than a year, thus protecting 1/3 of our bomber force, and it is believed that the Russians will not possess the needed 150 ICBM's until some months after the first two BMEWS stations are operational.

THE significant implication here is that the DOD, JCS and Air Force apparently reconciled themselves to the loss of 2/3 of their manned bombers due to Russian ICBM's. Under attack by ICBM's, SAC now could count on only 1/3 of its strategic manned bombers surviving such an attack. The military were compelled to write off the other 2/3 as a casualty of the ICBM era.

If it is argued that an airborne alert would be added insurance in an admittedly precarious strategic situation, *then we must consider whether such a force can really contribute to our defense.*

One of the first actions taken to alleviate the Russian ICBM threat was placing combat-ready SAC aircraft on a ground alert with a requirement that they be airborne within 15 minutes after receiving warning of an ICBM attack. The reasoning: with an ICBM flight time of about 30 minutes, a Ballistic Missile Early Warning System (BMEWS) could be used to detect the ballistic attack shortly after it was launched and thus provide, as a minimum, 15-minute warning for our manned bomber force.

However, when it became apparent that the successful operation of BMEWS and MIDAS could not be unequivocably guaranteed by the time the Russians possessed the capability to launch a sizeable ballistic missile attack against our strategic military forces, it was proposed that SAC develop an airborne alert capability. An airborne alert would guarantee that some of our bombers would survive a surprise Russian ICBM attack.

The significant point here is that while *having already suffered a 2/3 reduction of our strategic force due to vulnerability to ICBM's we would now be faced with a further reduction since it is apparent that fewer bombers can be maintained on an airborne alert than can be maintained on a ground alert.* B-47's, which represent almost 1500 of our 2000 SAC bombers, cannot be used in an airborne alert. Therefore, *as a maximum,* only about 125 of our 500 B-52's could be on continuous air alert.

The relatively small number of nuclear weapons which can be made invulnerable by airborne alert makes one wonder how we would use them in the event of war.

It is only too obvious that if there was a legitimate requirement for all the aircraft (about 2000) in SAC prior to the ICBM, an airborne alert which would provide us with only about 5% of this force would leave us with a rather severe deficit in the number of weapons required.

It is said that increasing quantities of Russian ICBM's will not create a deficit in our defense capability. Can this really be true? Let us answer just two questions. Have we had, all along, many more aircraft in SAC than we needed? Have the targets we want to destroy been so reduced in number that we can accomplish the necessary task with a drastically reduced force? The answer to the former is that *SAC was built to destroy Russian military strength, and the force required to do this was thoroughly computed and agreed to by the Chiefs of Staff of all the Services.*

This leaves a positive answer to the second question as the only possible explanation. If the number of targets is drastically reduced, then it is obvious that *our small airborne alert force would be used primarily to decimate Russian cities and people in an act of mutual suicide.* It would certainly be inadequate for any other purpose.

Then, under conditions of drastic numerical inferiority, will an airborne alert force contribute to our security? Obviously not. If such a force is incapable in retaliation of destroying the remaining Russian long-range military force, our defeat would have been accomplished by the first Russian salvo against our strategic strength. The Russians could then bring us to our knees by threatening or beginning the systematic destruction of U.S. cities with their superior strategic forces.

Protecting about 5% (125 B-52's) of SAC by putting them on an airborne alert is militarily insignificant in comparison to the threat against us. *A military force 18 months to two years from now which could begin a real struggle for survival with Russian forces will need at least 1/3 of SAC—not 1/20.* It is questionable whether even this larger number of aircraft (600 B-52's and B-47's) could hope to defeat the Russian forces.

IN SUMMARY: The purchase of a few hundred missiles, combined with a weak effort to guarantee the survival of yet a smaller number of aircraft by airborne alert, are not solutions but merely devices for trying to give some validity to a basic fallacy. Both these inadequate efforts are based on the indefensible assumption that there is something to be gained by our destroying or preparing to destroy only a nation's cities and people while leaving its military forces relatively intact. As long as this fallacy remains in vogue we will continue to produce inadequate, and possibly fatal, solutions to the new and stupendous problem of national defense in the space age.

The pity is this—if we feel even relatively secure behind a capability for destroying Russian cities, then we will never attack the problem of destroying the enemy's mobile strategic forces. We will merely build some mobile missiles of our own, label them as "invulnerable," and pretend that we have a "stable deterrent."

The shock will come (about 1963) when we at last have to admit that the military force which we have built for our protection is incapable of coping with the opposing force. Our inferior military force can then only be used to commit mutual suicide—and even this tragic and futile gesture cannot stave off military defeat.

The direction our national effort should take to provide us with a military force capable of functioning as a military force rather than as an inconclusive exchange of indiscriminate terror will be the subject of the third and concluding article of this series.

MOLECULAR ELECTRONICS

THE THIRD MAJOR BREAKTHROUGH in the history of electronics...

as significant today as the vacuum tube in 1907... as the transistor in 1948.

Molecular electronics use new insights into the structure of matter to create single crystals which perform one or more complete electronic functions in the control and transformation of energy.

Westinghouse can now report startling progress in this fantastic field—in this status report on a U.S. Air Force research program which began less than a year ago.

Fact one: molecular electronic systems are here today—in laboratory models which prove out the principle even as they pave the way for production models. On the next two pages are a number of different molecular electronic devices performing the functions of familiar systems, without conventional components.

Fact two: each one incorporates germanium or silicon crystals—etched, sprayed or alloyed.

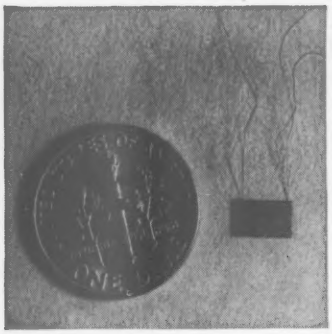
Fact three: each one is a functional block which performs the missions usually requiring conventional components soldered together.

Prediction: soon, multi-zoned crystals will be "grown" and processed directly from the furnace melt—may emerge as ready-made electronic systems.

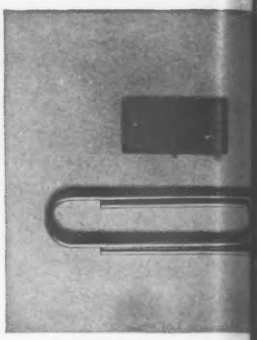
Prediction: only two to five years from now, the pattern of electronic systems will be changed to the core as a result of this historic Westinghouse breakthrough in research and development. Reliability, miniaturization and simplicity will show exponential progress.

Westinghouse presents working proof of the principle of molecular electronics

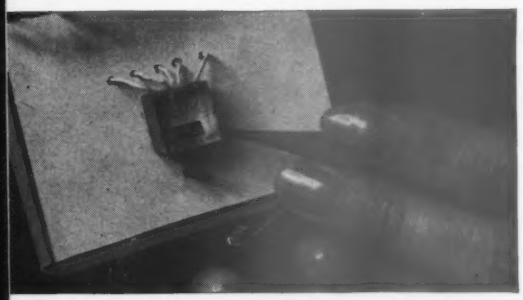
POWER AMPLIFIER: Button-sized molecular electronic device held by girl with a pair of tweezers performs the same amplifying function as a conventional 5-watt amplifier, has a frequency range from zero to 20,000 cycles. Working element is a block about as large as the head of a pin.



VIDEO AMPLIFIER: made with a tiny wafer from a ribbon of germanium crystal. This function block also works like a radar amplifier sub-system. Gain is essentially flat to frequencies of several megacycles.



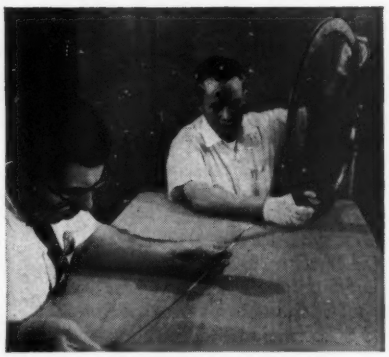
MULTIVIBRATORS: stable, monostable, astable—covering quencies from 1 cyc less to 3 megacy Shown is a free run multivibrator along paper clip.



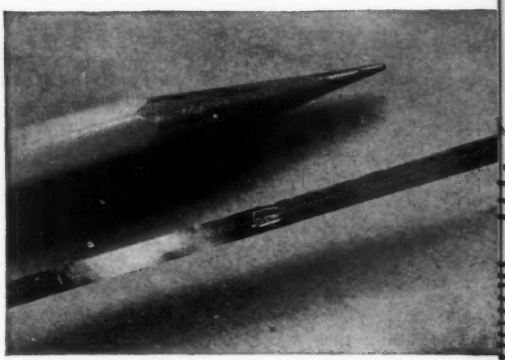
MULTI-POSITION SWITCHES: these molecular electronic devices evolved out of Westinghouse work on multivibrators—the "OR" logic switch illustrated has important potential applications in missile countdown functions.

LIGHT TELEMETRY SUB-SYSTEM: a single light-responsive monolithic element delivers output whose frequency is a measure of light intensity.

D-C AMPLIFIER: connected to a solar cell, this tiny block takes an input of 4 milliamps . . . via flashlight beam, raises it to 40-watt output.



CRYSTAL GROWING techniques developed by Westinghouse have already produced germanium dendrites 300 feet long in the special furnace shown at left, above. Crystal ribbons of almost any length are possible. The take-up reel at right holds 300 feet of the brittle dendrite with each turn cushioned on glass-cloth tape.



CRYSTAL RIBBON requires no grinding or lapping. Only a few steps are needed to turn these "educated" crystals into working electronic systems. Above, multiple-junction systems are shown on a crystal section.

The meaning of molecular electronics

RELIABILITY: molecular systems reduce drastically the number of components and internal connections required—and the fewer components and connections the fewer potential trouble spots.

MINIATURIZATION: molecular electronic systems are less than one-thousandth the volume and weight of conventional component systems. This is a conservative generalization—in many cases, much more startling size and weight reductions are possible.

POWER REQUIREMENTS: input power can drop almost as fantastically as size and weight. In a typical flight telemetering sub-system, a 5-watt input is required; the transistorized version gets by with 0.75 watts. The same function is still performed by a molecular electronic block requiring but 0.06 watts.

ENVIRONMENT: inherently more resistant to g-loads because of their small mass and few components, Westinghouse-developed molecular systems show promise to be temperature and radiation resistant as well. New semiconductor materials and new large crystal surfaces point to very high temperature and power-handling capabilities.

FUTURE: progress in this new field is so rapid, and the advantages so great, that the molecular electronics concept will find wide applications in air/space electronic systems within 3-5 years . . . In particular, look for great advances in the state of the art in these areas: telemetering • fire control guidance • communications • counter weapons • flight control—as a direct result of the new molecular electronics era.

The Air Arm Division of Westinghouse Electric Corporation holds the U. S. Air Force management contract for this project. It is being supported by the Semiconductor Department, the Materials Engineering Department, and the Westinghouse Research Laboratories.

J-02311-1-3

WESTINGHOUSE / DEFENSE PRODUCTS

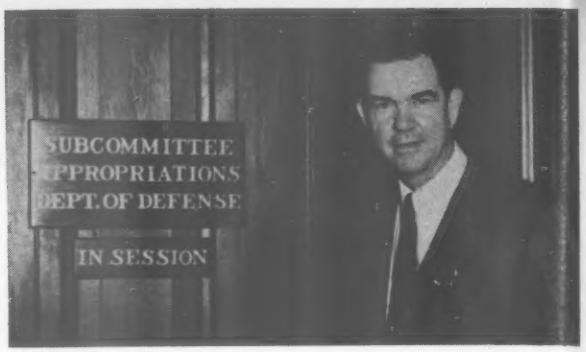
1000 CONNECTICUT AVENUE, N. W., WASHINGTON 6, D. C.

Pentagon Profile

This Month:

George Herman Mahon

Chairman
House Defense Appropriations Subcommittee



"THIS COUNTRY can afford to spend the money for a reasonable defense program. And it can't afford to spend a penny less." The speaker is George Herman Mahon, the tall, soft-spoken Texan who serves more than ably as chairman on one of the toughest, most complicated committee assignments that the House of Representatives has to offer—the House Defense Appropriations Subcommittee.

The size of the job is measured by one Pentagon Legislative Liasion officer, a man who works constantly with the House Group: "There is probably no committee on the hill with bigger problems than this one. I don't know of a committee up there that doesn't have something in the way of politics to contend with, but consistently, year in and year out, Mr. Mahon's committee puts the good of the nation first. Their decisions are not always the ones that please us most, but I know the hours they have to put in, and they always do their damndest to turn out the best bill possible."

Perhaps no single individual is more instrumental in turning out this sort of defense bill than the 60-year-old Congressman from Lubbock, Texas. With almost 20 years behind him on the committee, Mahon probably knows more about defense business, defense spending and defense policies than any other individual in Congress.

Looking back to 1940, when he first joined the committee, Mahon recalls "it was pretty much a horse and buggy affair. We were able to just about count the nuts and bolts and nails in the War Department's proposals. Of course we can no longer do this, and it looks as if we are going to have large defense budgets for some time to come."

This is not to say that today's huge and complex Defense Appropriations bills are not raked over in detail. On the contrary, it means that the job with which Mahon's subcommittee is charged has grown in direct proportion to the complexity of defense spending.

Points out one Navy Captain who works closely with Mahon's group, "I'm not in the least reluctant to say that Mr. Mahon is an extremely fine chairman. I think the entire committee does a tremendous job, paying attention to even the many side-issues that come up. They really put out a tremendous effort not to miss anything."

As is often the case, Mahon's appointment to the Committee some 20 years ago was almost by accident. At the time the group was considering a proposal to buy Army aircraft, and the committee was deadlocked along political lines, unable to get a majority either way. The then-chairman of the Committee approached Mahon, and said he could get him the appointment —if he would vote in favor of the aircraft purchase. Characteristically, Mahon's position was in favor of the purchase, and the stronger defense posture that would result. But he was not overwhelmed with the idea of serving on the committee.

It took the persuasive talents of House Speaker Sam Rayburn, the committee chairman and several other interested Representatives to convince Mahon that he should go ahead and take the assignment. Eleven years later, Mahon became ranking Democrat on the committee, and since then has held down the chairmanship whenever his party was in power.

If chairmanship is the legally accurate term for Mahon's position, perhaps leadership the more apt word. Mahon's ability to weld his subcommittee together is well known. It was perhaps most graphically demonstrated during last year's Congress when Mahon worked on the floor of the House with his ranking minority member, Gerald Ford of Michigan, to get the bill they had drawn up together adopted.

As closely as Mahon is associated with the Pentagon and its way of doing business, it is not surprising that he has definite ideas on Military management, financial and otherwise. The measure of the importance of this is summed up by Mahon himself:

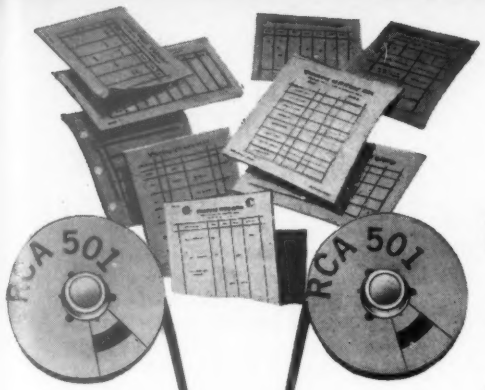
"We have to deal with the Pentagon's decisions, or the lack of them. In the past, one glaring defect has been the inability to get prompt decisions out of the Joint Chiefs of Staff. It's hard for us to approve a budget if we don't know just about exactly what these people want. It's often better to make a less-than-perfect decision than it is to wait until the 'perfect' one can be made. You always get more for your money if you get on with the job. I think Mr. Gates' decision to step in on the difficult JCS problems may help alleviate this."

In other areas, Mahon's views are as firm. On funds appropriated by Congress which are not spent on schedule by the Executive Branch: "The Executive has no right, in good conscience, to do this, unless there are very special circumstances that apply, and we seldom hear of these. And about all we on the hill can use against this is persuasion as we did with Polaris. Legislation to prevent this isn't too likely. There would be a constitutional question raised, in our depriving the Executive Branch of the right of managing its own funds."

One of the most ticklish problems that Mahon's committee must face in approving the Defense budget is the inflationary factor which has characterized the Nation's economy for the past several years (Estimated by Mahon at 3-7%).

"Because we are faced with both appropriations and spending ceilings, Defense Department is in need of continually greater efficiency in its operations. While this inflationary trend is certainly a strong incentive for better defense management, there is also a factor which tends to keep waste proportionate to the total budget, so you can't go too far with this."

Perhaps the best tribute that can be paid to George Mahon is the success of Defense policies during the years he has held the chairmanship of his committee. Working within a tight budget, and in the face of an economy minded administration, Mahon has managed to give Defense Department just as much as is possible under the circumstances—with virtually nothing but meat on the bones of the appropriation bill.



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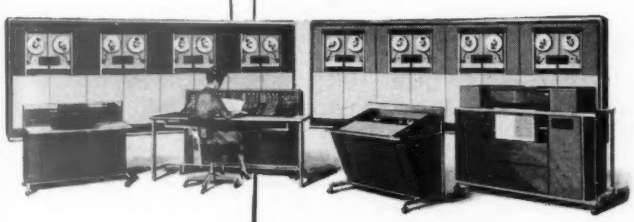

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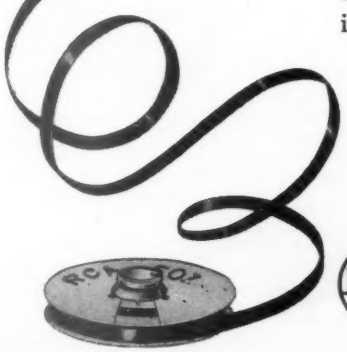

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Supply Vouchers And Positive Control

Air Force Academy's supply operation has been greatly improved by following up on a good idea for better management. This is the story . . .

Denver, Colo.—An automatic voucher numbering system, successfully operating at the United States Air Force Academy Base Supply, is providing accuracy and control in distributing some 10,000 supply items.

Based on an idea by Chief Warrant Officer Wallace H. Cooper, while assigned as Supply Operations Superintendent with the Materiel Plans Division of the USAF Academy Headquarters, the system was developed and produced by Cincinnati Time Recorder Co., of Cincinnati, Ohio. CWO Cooper was the first property accounting officer of the Academy's Base Supply.

The main ideas are to provide an accurate record of each voucher issued, know from which of three separate stations it was issued, keep a perfect sequence of voucher numbers, and be able to compile reports as fast as possible.

The Old Way

Under the old system, numbers were taken from a prenumbered master register and assigned to various sections with vouchering requirements. As numbers were transferred by hand to each voucher, a suspense copy was placed with the register sheet. When all numbers were used, the register sheet, with suspense copies attached, returned to the Central Voucher Section, and new numbers assigned.

Central control was lacking over suspense copies and there was no continuity in assigning voucher numbers. Some sections using fewer numbers might be assigning lower sequence numbers than those assigned by another section earlier.

The new automatic system ends the need for assigning vouchering personnel and voucher register pages at different locations in base supply. According to Maj. T. K. Schafer, Academy Base Supply Officer, there can never be a lost voucher under the system's positive control.

The system includes a master control machine and three slave stations. All four stations have an automatic numbering device ranging from 0 to 999,999. Vouchers are numbered only at the slave stations with continuous registration on tape recorded at central control. When a voucher is numbered, eight copies are made. Vouchers are automatically fed to the slave station for the imprinting run. A switch box, located next to the central control, has a signal light indicating when the system is operating. A master switch can de-activate the system in the event of malfunction.

Since the electrical circuit carries a single electrical impulse, only one slave station can operate at a time, preventing accidental wrong numbering at other stations. As the number is printed on the voucher copies, it is recorded at the central station. Each slave station has a letter prefix so central control has a complete register.

About thirty seconds after a voucher is numbered and issued, a suspense copy is sent by pneumatic tube to the central control section.

Only three slave stations are in use, but the system can be increased to six. Officials of Cincinnati Time Recorder Co., say larger systems could manage up to 12 stations.

Located in the big 195,000 square foot Academy warehouse, the three slave stations are 147, 479, and 560 feet from the central control. One is in property accounting, another in central issue, and the third is in the receiving and classification offices.

The system handles 100 to 500 documents per day, depending on how many supply requests, receiving reports, and other supply documents are on hand. The system can number about 1500 vouchers daily. Each document measures 8½ by 11 inches but Cincinnati Time Recorder says the slave stations can be modified for any size.

What was Gained

Maj. Schafer cites several other advantages. Continuity of voucher number sequence is assured since the system trips all stations to the next number regardless of which station assigns the number. Number of vouchers used during the fiscal year can be determined any time by simply taking the last number appearing on the master machine tape. Vouchers assigned during any given period are easily determined by subtracting the voucher number used at the beginning of the period from the number used at the end. This is especially useful when information is required for various management reports and when higher echelons call, on short notice, for facts and figures.

Another advantage was to eliminate handscribing numbers to documents. Voucher numbers are always legible and appear in exactly the same location on all documents—the lower right hand corner.

Thus, the overall system is almost fool-proof in the prevention of errors and can be expanded to meet future needs of the Academy.

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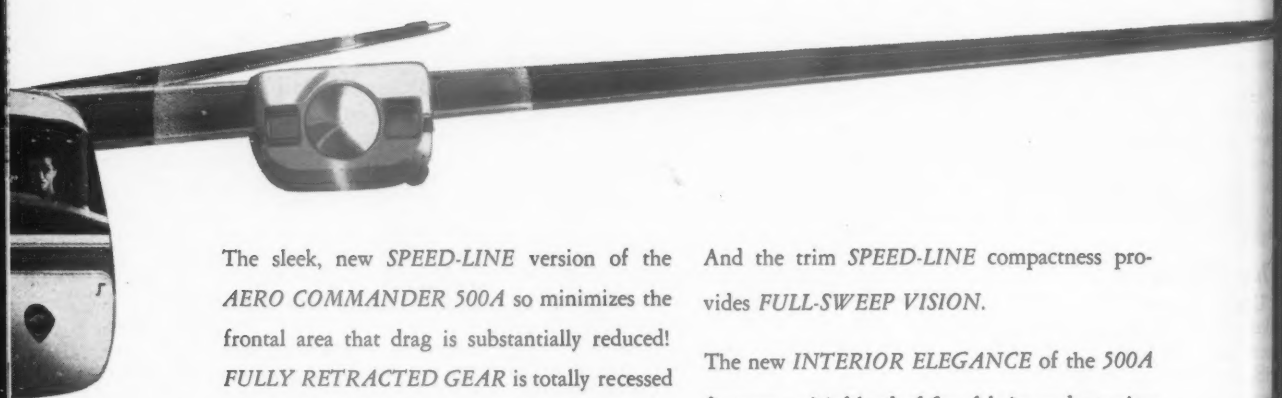

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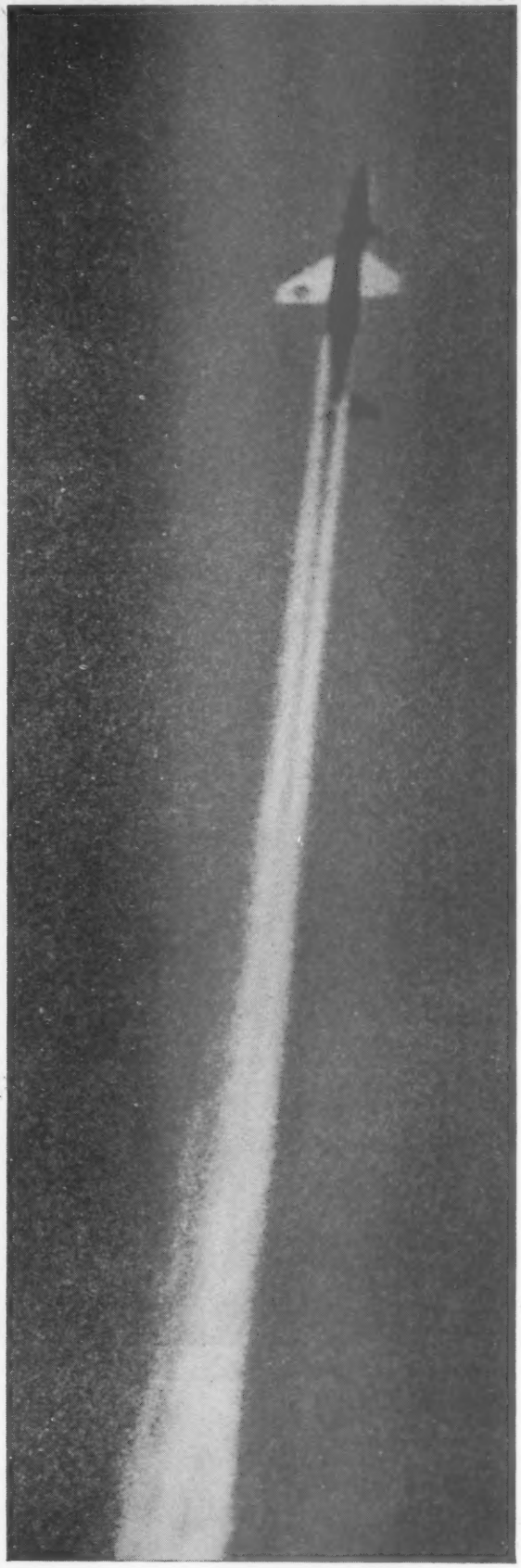

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Research Rundown

HYDRO-FOIL AND AIR-CUSHION LANDING CRAFT look like good answers to Marine Corps landing needs on possible atomic resistance to landing operations. Dispersal of forces at sea means longer distance to travel, requirement for greater speeds. Most promising item to date: a Swiss-developed air-cushion craft capable of up to 50-mph with a 3000-lb. payload.

MARINES FEEL THAT THEY NEED LANDING CRAFT that will operate effectively beyond 35-mph, say "we couldn't care less about size or weight" if the given ship-to-beach craft can move this fast, carrying a reasonable load. Need is emphasized by Gen. Shoup's statement to Congress that he can foresee "only a mix" of ships and helicopters for landing operations.

MISSILE SCHEME OF THE MONTH, as proposed by the Pentagon's tongue-in-cheek contingent, would be to handle the big birds on a rental business, with full payment coming with actual firing. Among the advantages, say the psuedo-seers, would be the great savings accrued with obsolesence, since there would be no full purchase price involved. Acceptance chances: not likely.

SEGMENTED SOLID ROCKETS MAY OFFER FUTURE ADVANTAGES, using the building block principle with solid propellants. Aerojet has built mock-ups, tested small units to prove out the theory. Segmentation would, like 105-mm artillery rounds, allow the firer to match his power requirements to the mission at hand.

AMONG THE GROWING USES OF SOLID PROPELLANTS is a recently announced Navy application of extruded ammonium nitrate propellant. A small disc of the solid fuel is used to activate hydraulic and electrical power turbines in the Tartar and Terrier. Advantages include clean burning, immediate power, and a good rate of reliability.

ALTHOUGH "NO ONE IS LIKELY TO ADMIT IT FOR PUBLICATION," something less than complete satisfaction exists in the Marine Corps for returns on money invested in Army research projects. Problem stems from basic difference of the missions of the two services, is not likely to be resolved because of this. Shrugs one Leatherneck, "you have to expect to lose a little money in any sort of research work."

PROJECT DROMEDARY, AN OFFSHOOT OF THE CAMAL nuclear-powered flying missile platform, is currently classed as a systems study at Norair. Using chemical fuels instead of atomic power, Dromedary would aim at similar endurance goals. Camal, in the meantime, has been withdrawn as a General Operational Requirement, being relegated to a pure research-type study.

PART OF THE PRICE TAG ON ASROC—the installation costs—has been set at $1-million per system per ship. Some of these costs will show up in this year's budget (fiscal 1961), with Navy aiming for a January, 1961 operational date on the first systems.

INDICATIVE OF THE COMPLEXITY OF TODAY'S TECHNOLOGY is the recent announcement of the consolidation of Cleveland Aero Space Association, Inc., a group of nineteen firms in northeastern Ohio, pooling their talents to offer what amounts to a multiplication of facilities and skills. The group has pooled specifically "to obtain and perform government contracts."

"COMPLETELY SUCCESSFUL" FIRST FLIGHT OF CORVUS, the Navy air-to-surface missile was conducted last month. Launched from an A3D jet, the test version missile performed its first guided flight without a hitch. To be eventually carrier-based, the Temco-built bird uses a pre-packaged liquid propellant.

Future Space Travel Seen As Breakthrough

Advantages of military space operations have been outlined by Maj. Gen. Leighton I. Davis, Air Force Assistant Deputy Chief of Staff for Development.

Speaking to members of the National Security Industrial Association in Washington, Davis said, "We are on the verge of a breakthrough in military space operations of considerable magnitude and significance . . . Actually travel in space will be easier from the standpoint of vehicle propulsion and stress problems than similar operations in the atmosphere."

Because of this, Davis said, military space operations will be "routine—easier than operating in the earth's atmosphere" ten years from now.

The Air Force general pointed out that from an aerodynamic standpoint it is impossible to fly faster and faster at constant altitude in the atmosphere. He said temperatures and stresses become infinitely great, but that once free of the atmosphere, "even aluminum can stand the temperature and stresses."

He cited other advantages including guidance and control benefits, unhampered by disturbing influences and the ability for "precise spatial orientation from fixed stars, undimmed by atmosphere."

General Davis stated hazards to be overcome, such as radiation and sunbursts but said "as soon as our scientists and engineers have solved remaining design problems and industry has produced reasonable quantities of parts for such systems as Midas and Samos, military operations in space will be practical."

$82-Million Contract Let on Pershing Work

Continued research and development on the Pershing missile system will be handled under a recent $82-million Army contract. This contract, with others, brings the total amount for Pershing in fiscal 1960 to $118,-057,000.

Pershing is a two-stage, selective range, surface-to-surface ballistic missile. First limited range firings have been successful.

To be used as a tactical support weapon, Pershing offers extreme accuracy and high mobility.

Pershing is being developed under technical supervision of Army Ballistic Missile Agency by the Martin Company at Martin's Orlando Electronics and Guided Missile Division.

Repeal of ARPA Law Urged by House Group

House Armed Services Committee has recommended repeal of the law that set up Advanced Research Projects Agency. The group pointed out that ARPA now functions under the Director of Research and Engineering, and that there is no need to continue its statutory authority.

The subordinate role of ARPA to the R&E office is generally accepted at the Pentagon.

The recommendation was made in approving $983-million in new spending authority for military construction. The bill includes $318.6-million to provide operational test and training facilities for Atlas, Titan, Minuteman, Bomarc, Samos and Midas.

The committee during the 85th Congress gave the Defense Secretary temporary authority to establish an agency for pursuing advanced research projects. Under subsequent Pentagon reorganization, the R&E office won a dominant role.

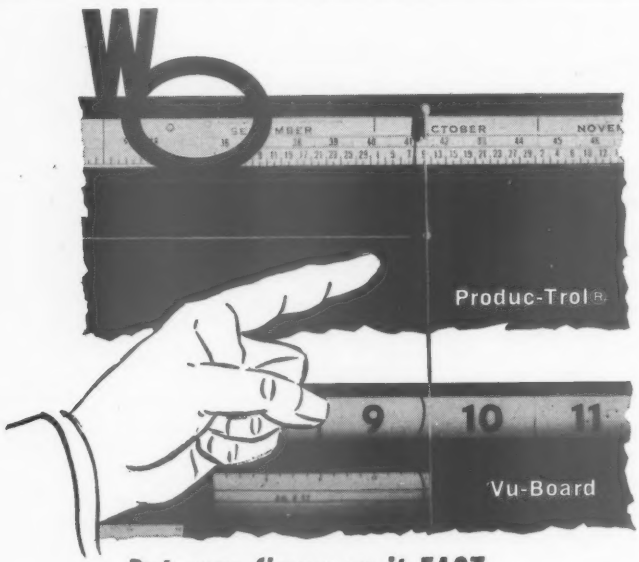
Orion Goes to Air Force After NASA Refusal

National Aeronautics and Space Administration has refused to take over Project Orion, William H. Godel, director of Advanced Research Projects Agency policy and planning has told a House Space Committee.

The President's space report recently revealed that the project has been shifted from initial study status to more advanced engineering during the past year.

Godel said Orion will probably go over to Air Force, although no extra funding would go along with the transfer. Orion presently costs about $1-million a year.

The same House subcommittee was urged to consider the long-range potential of nuclear propulsion, and to push for more emphasis on nuclear techniques. Brig. Gen. Irving L. Branch said that NASA's $5.5-million contribution to nuclear studies in the fiscal 1961 budget is not enough.



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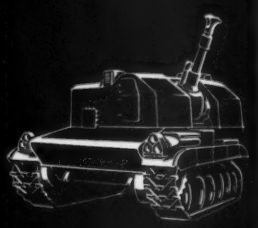

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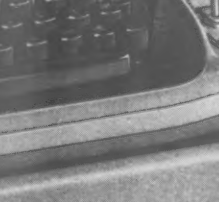
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Branch said Project Rover could be stepped up and ready for flight within a few years. He described one rocket now being developed capable of launching 1000 lbs. 1000 miles into orbit. The whole system, he said, would weigh only 40,000 lbs. and produce thrust equivalent to about 52,000 lbs.

This rocket, part of Project Rover, could not be readied until after Rover ground tests took place, Branch said.

Navy Reports Progress In HSS-2 Development

Rapid progress in the development flight test program on the twin-turbine HSS-2 helicopter has been reported by the Navy. The anti-submarine weapon system is produced by Sikorsky Aircraft.

At the same time, Navy announced successful work with helicopters clearing mine fields. With a Sikorsky S-60 Skycrane, lightweight mine sweeping gear in a pod under the airframe was used to sweep the fields.

In the HSS-2 program, one helicopter flew about 50 hours in seven work days and during a single day flew 10½ hours. Another hovered continuously for more than three hours, Navy says.

In connection with the helicopter test program sonar dips have been made in Long Island Sound, with indications that the new gear will offer major improvements over existing sonar.

New Research Method Outlined by ARDC

A new way to achieve AF technical advances in the future—called the planning objective approach—has been outlined by ARDC's Col. E. C. LaVier. To be ready to go by 1962, the new system will include two dates—one serving as a deadline for applied research, the other final operational date.

Other details under planning objectives would be item descriptions, their military purposes, technical references and desired performance specifications. An ARO (Applied Research Objective) would define specific technical efforts, spelling out just what the Air Force wants to do. Having surveyed what is being done, and what must be done, Air Force will automatically come up with what amounts to a scheduling system.

Technical forecasts would go to scientists and industry, according to AF planning, thereby letting them know just what is needed on a given project in terms of years.

LaVier said, "We hope to solve the engineering integration problem by setting in motion the required effort so the decision to develop can be made as we acquire the capabilities for doing a job on any device or system . . . This product-oriented approach to technical progress is one of the promising results of reorganizing ARDC."

Moon Mapping Projects Finished by Air Force

Two projects covering photographic studies of the moon and better techniques for determining contours on the moon have been completed by the Air Force.

First study contained 280 photos of the visible side of the moon, chosen for their quality from various observatories. Begun in 1957, the study was run by the Aeronautical Chart and information Center, Military Air Transport Service Air Photographic and Charting service.

The study of moon contours was handled under AF contract by Dr. Z. Kopal of the University of Manchester, England. Photographic data was collected on particular areas of the moon at its sunrise and sunset, using a variation of the microdensitometer.

In this way, relative heights of lunar prominences can be spotted with much greater accuracy than was previously possible.

Rubel Replaces Wilcox In Defense Research Job

John H. Rubel, former assistant Director of Defense Research and Engineering (Strategic Weapons) will become director of that office as this issue goes to press.

Rubel replaces Dr. Howard A. Wilcox, who held the job since March 1959, and who is now returning to private industry.

Working with Hughes Aircraft Co., Rubel worked with one of the earliest successful automatic celestial navigation systems, and was associated with development work on the Falcon air-to-air missile.

His experience covers most of the area of airborne systems, including radar, digital and analogue computers, guidance and control systems, and communications sub-systems.

Industry Developments

Ford Establishes New Defense Products Group

Ford Motor Company has set up a Defense Products Group under Gerald J. Lynch, company vice president and

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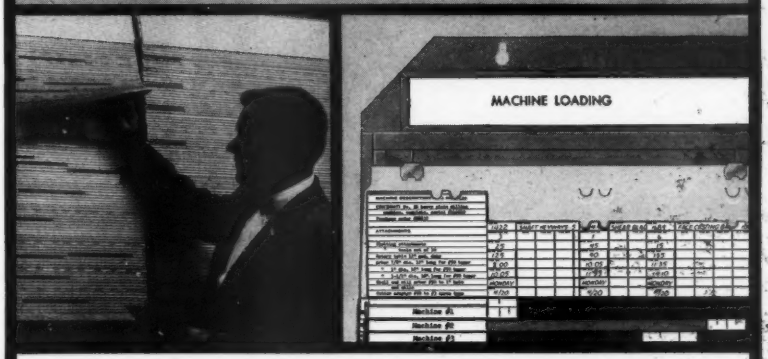

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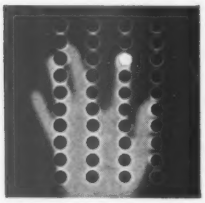

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This electro-mechanical teaching system takes men out of the classroom and puts them on the line quickly, economically and thoroughly trained. The new TUTOR system:

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ASSURES COMPLETE, UNIFORM TRAINING

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For more facts request No. 6 on reply card.

general manager of Aeronutronic Division.

Named vice president—Defense Products Group, Lynch will continue to direct the Aeronutronic Division as general manager and will also direct operation of the following activities engaged in defense work:

(1) Special Military Vehicles, formerly a part of the engineering and research staff;

(2) Mobilization Planning and Defense Sales, formerly part of the manufacturing staff;

And (3) Defense Contract Administration, formerly a part of the finance staff.

The new group will be responsible for all defense programs, and will develop commercial product opportunities arising from defense work.

Principal operations of the Aeronutronic Division are at Newport Beach, Calif. The other entities under the Group are located at Dearborn, Mich.

New Computer System Built by Royal McBee

Data Processing Division of Royal McBee has announced a new, fully-transistorized, electronic stored program, general purpose computing system, the RPC-4000.

The RPC-4000 electronic digital computing system is equally suitable for engineering problem solving and processing business data to control inventories, produce payrolls, analyze sales and provide other management control information.

The computing system can store 8,008 words on its magnetic drum and can add up to 3200 9-digit numbers per second. It can complete a memory search of 8,000 words in 2½ to 4 seconds, and can handle as many as 17 input-output devices connected on line simultaneously with standard system.

Through programing, the computer has complete control of the selection of devices for input-output. A line printer and a magnetic tape unit will be available in the near future.

Prototype Space Engine Moves Nearer Reality

Republic Aviation Corp. has said a "magnetic pinch plasma engine"—expected to be a leading factor in interplanetary space travel—has been running continuously for over 118 hours.

Republic says the development came much earlier than anticipated. A company spokesman said this marks the first time scientists have been able to achieve continuous cycling of the plasma "pinches" that power the engine. Shut down temporarily for inspection, all equipment was found to be working in perfect order.

Republic attributes its progress to development of more direct fuel-feed, and rugged electrodes. Problems of overhearing and erosion have been overcome in the project.

Republic's work is sponsored by office of Naval Research and the Air Office of Scientific Research.

Military Products Div. Set up by Bausch & Lomb

A separate Military Products Division, to work with the government and prime contractors on national defense hardware has been announced by Bausch and Lomb Optical Co.

To be headed by W. A. Kerr, the Division has set as major objectives (1) to establish Bausch & Lomb as a research and manufacturing source for integrated optical-mechanical-electronic systems; (2) to obtain contracts for the manufacture of such systems; (3) to develop improved optical solutions to problems which have previously considered to be in the electronics field.

The new group will have its own sales division. Kerr will report directly to the President of the firm.

B&L is presently working in the areas of infrared optics and heat transmitting filters used in missile guidance systems. Herron Optical Co., a subsidiary, will lend its facilities, geared to missile and rocket work, to the Division effort.

New Processing System Developed by Bendix

A new electronic data-processing system for fast scientific, business and general industrial use has been developed by Bendix Aviation Corp. The system is designated G-20.

The machine can handle 45,000 floating point operations per second, and is said to offer versatility, expandability and high computing power at relatively low cost. Costing less than $10,000 per month, the G-20 is said to be much faster than other computers with similar price tags.

Solid-state configuration and highly automatic operation make the cost of operating the computer fairly low. Unlike some other machines, the G-20 is said to be able to supervise its own operations to a fairly great degree.

The machine can be had in several different alignments, to meet specific customer needs. The G-20 also boasts a simplified control desk and reduces operator duties to largely inserting and removing tape. Containing 5000 transistors, G-20 is only 66 inches wide, 60 inches high and 28 inches deep.

Procurement Trends

AMBITIOUS FUTURE FOR THE COMPUTER INDUSTRY is outlined for those who will listen by IBM, the grand-daddy of them all. The schedule: in 1-3 years, machines that will take typed input (letters, memo copy) ; 3-5 years, input handled on a coded verbal basis; and in a maximum of ten years, pure verbal instructions for the electronic brains.

ONE OF THE GOALS FOR COMPUTER MINIATURIZATION work is set for the next five-or-so years, would be to build a computer roughly Thermofax size capable of handling all financial work for an average small business. Using typed input, the small machine would theoretically have a price tag in keeping with the market it would serve.

DEFENSE REACTION TO HEBERT OFFICER-HIRING REPORT is in the mill under the Assistant Secretary for S&L, where one spokesman says "we are pushing this as hard as we can." Also under study: so-called single manager proposal for communications. "This one is moving a little slower, although we have had no official reclama."

GENERALLY INCREASING EMPHASIS ON THE AIR and missile forces as a means of fighting wars is reflected in this year's Royal Air Force budget, up by $102.5 million. Of this, some $600-million will go to aircraft, guided weapons and other armaments, with the bulk of this slated for guided weapons.

A NOTE OF CAUTION WAS SOUNDED BY CARL VINSON at this year's Navy League Seapower Symposium, to wit: "we must avoid the danger of overcommitment to a single concept. Notoriously a Navy booster, and certainly in the proper element for this sort of thing, Vinson said flatly that a modernized Army was needed, added that he felt the nation was overlooking the future of manned aircraft, in an obvious reference to the demise of the B-70.

NEATEST TRICK OF THE WEEK, SAY SOME MARINES, will be to devise a system for supporting the new XM-70, 2½-round-per-second rocket boosted artillery weapon. At 18 rounds each minute, the pipeline will have to be prodigious for a branch of the service notorious for travelling light.

REORGANIZATION IS IN THE WIND FOR WADD, the Air Force's Wright Air Development Division, located in Dayton. First official word should be out sometime this month. The switch will be the second at WADD within the year, the other having taken place last fall.

A MEASURE OF THE PROGRESS OF WEAPON SYSTEM BUSINESS is offered by the Air Force/Boeing contract on Minuteman. Boeing is responsible for assembly and test, will spend 27.1% of total funds at outside sources. Of a total $140-million-odd in the program with three associate primes, about 60%—about $82-million—have been subcontracted.

SPACE WORK EMPHASIS IS SHOVING AIRCRAFT DEVELOPMENT "DOWN THE DRAIN" in the words of VAdm. J. T. Hayward. The Navy DCNO/Development said that aircraft research work formerly handled by National Advisory Committee for Aeronautics has been eclipsed by NASA stress on space.

AIR FORCE DECISION TO SCRAP VTOL RESEARCH WORK in favor of an STOL type aircraft would seem to bear out Hayward's contention, will do little to bail the Air Force out of a nuclear strike. Enemy will still have fairly large targets to shoot at, rather than the small and scattered targets VTOL craft could offer, with their not needing runways.

The sure hand of AE in Coordinating Communications

AE is an old hand at developing military communications devices and systems with unusual capabilities.

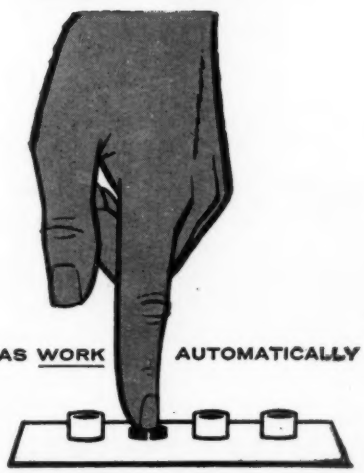
A prime example is the coordination device used in conjunction with the AE-developed automatic teletypewriter switching center.

Messages on punched tape arriving at a routing center are automatically given proper priority status... earmarked for single or multiple destinations and assigned to the first available open circuits for regional or global transmission to command centers.

Complex detailing and switching such as this is a logical extension of AE's wide experience in the design of complex circuit routing systems for automatic telephone exchanges.

If you have a tough problem in communications or control, AE can supply the answers – and provide the components or complete control systems to wrap it up. A letter or phone call (Fillmore 5-7111) to the Manager, Government Service Division, Automatic Electric Sales Corporation, Northlake, Illinois, will bring quick results.

AE CAN DO



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MAKING IDEAS WORK AUTOMATICALLY

The high frequency radio waves that carry telephone and television signals travel in straight lines and refuse to follow the earth's curvature. To overcome this, it may well be practical and economical to send them over long distances by using earth satellites as relay points.

Telephone Calls and TV Shows by Way of Outer Space?

Under construction in foreground is a new antenna which Bell Telephone scientists hope will receive signals reflected from earth satellites during forthcoming tests. Background: a Project Echo transmitting antenna.

Maybe some day you'll get phone calls from Brisbane or Bombay—live TV from Caracas or Copenhagen—via satellites!

Over the years imaginative research has vastly improved your Bell Telephone service.

Now Bell scientists are looking ahead to an extraordinary possibility, until recently only dreamed of: the sending of telephone calls and TV across oceans via earth satellites.

To explore this idea, Bell Telephone Laboratories scientists are presently working hard on the communication phase of Project Echo. This experiment, sponsored by the National Aeronautics and Space Administration, seeks to reflect radio and voice signals across the U. S. by means of a 100-foot satellite.

Recently these scientists relayed a human voice from New Jersey to California via one familiar satellite, the moon, and also sent a signal several hundred miles by means of an aluminized balloon.

Many features of the telephone service we take for granted today once sounded as improbable as this. But working always on the frontier of science is one of the ways we make that service more convenient, economical and enjoyable for you.

BELL TELEPHONE SYSTEM

Procurement Trends

Pentagon to Publish Procurement Needs

A revised Armed Services Procurement Regulation setting forth new rules governing publication of proposed Pentagon buys is due for release from the printer at this writing, according to Perkins McGuire, Assistant Defense Secretary for Supply and Logistics.

The revised procedure is expected to nearly double present dollar volume of proposed procurement appearing in the synopsis of U.S. government proposed procurement, sales and contract awards.

To be published daily by the Department of Commerce, the synopsis will answer Congressional complaints of secrecy surrounding issuance of some negotiated procurement. McGuire said, "Action has been taken to require more of our proposed procurements to be given advanced publicity . . . this action was based on our desire to give publicity to as much of our negotiated procurement as practicable."

McGuire said he felt DOD is becoming more expert in handling small business set asides. Backing this up, he said it looks as if DOD will do a better job of awarding defense contracts to small firms this year than was done last.

McGuire said DOD has "ample rules" to protect itself against contracting officers becoming "too friendly" with contractors. He added, "Contractors have got to realize that what looks wrong in the public eye should not be done."

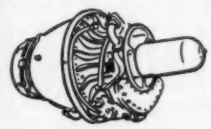
Material Transfers Too Loose, Says GAO

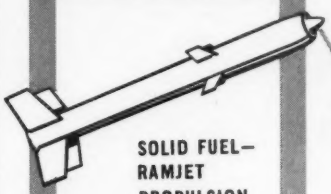
General Accounting Office has asked Defense Department for more aggressive monitoring of excess material transfers from the services to Military Assistance Programs.

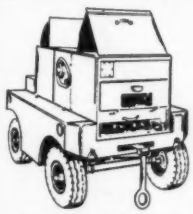
In a recent report to Congress, GAO said the military departments have violated the law by charging for deliveries of major quantities of material that should have been transferred free as excess.

The GAO report also said while major reductions have been made in pricing certain transfer items, reimbursable transfers often are not priced in accord with the law.

Specifically, GAO said, Navy has not adjusted its unit prices for conditions and market value; Air Force has made


TURBINE PROPULSION


SOLID FUEL—
RAMJET
PROPULSION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• Continental Aviation & Engineering Corp. is exceptionally well qualified, both by experience and by facilities, for work on the weapons systems of tomorrow. Our background embraces not only a half-century of internal combustion engine experience, but also years of pioneering in gas turbine engine development, and more than a decade in the field of solid fuels for ramjet propulsion of missiles and target drones . . . Continental is staffed and equipped for a wide range of assignments, military and commercial. The Detroit Division Research and Development Department is supported by our modern-to-the-minute Component Testing Laboratory complete with environmental facilities located at Toledo. The Toledo Production Division now producing various turbine engines in volume is capable of supporting diversified programs . . . The CAE record of achievement is one of which many a larger company might be proud. Inquiries are invited from those having propulsion problems, on the ground, on the water, in the air.

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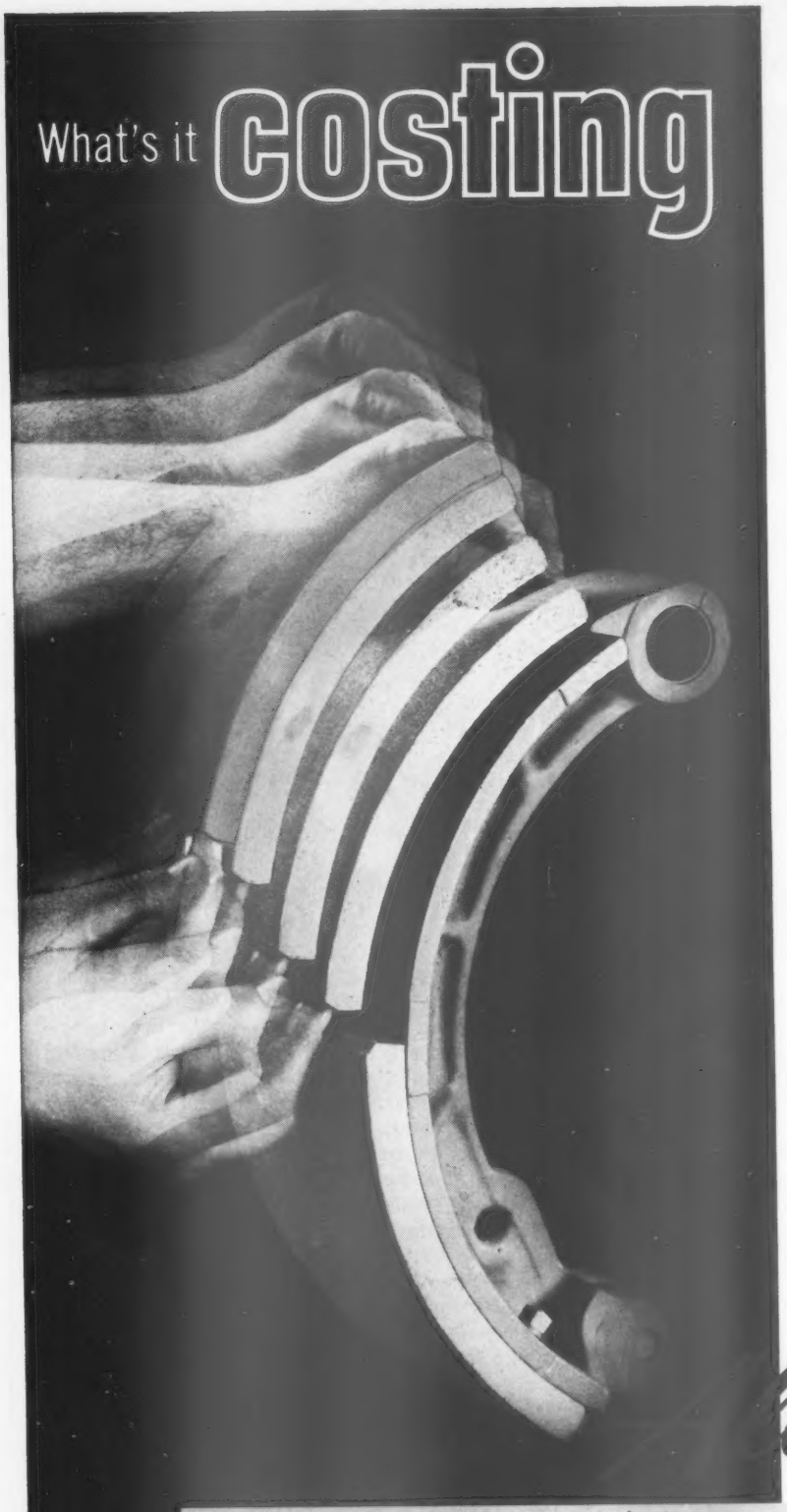

Want to save the $1,000 *or more* brake jobs can cost you in a year? TORQMATIC DRIVE owners will tell you it's automatic with the built-in retarder, which also provides the added safety of another braking system.

For this optional TORQMATIC DRIVE feature saves service brakes for everything but full stops. Naturally linings last far longer... downgrade runs are safer.

TORQMATIC owners also report saving up to $2,000 every time they train a new driver... eliminating one engine overhaul out of three... wiping out engine-disconnect clutch costs.

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Sure you'll pay more for TORQMATIC — but you quickly get your money back in repair savings. And TORQMATIC also speeds job cycles—there's no need to slow down for shifts.

More and more operators are ridding themselves of their clashbox-caused expenses by switching to TORQMATIC. It's been proved on years of tough jobs. Details? See your dealer or write Allison.

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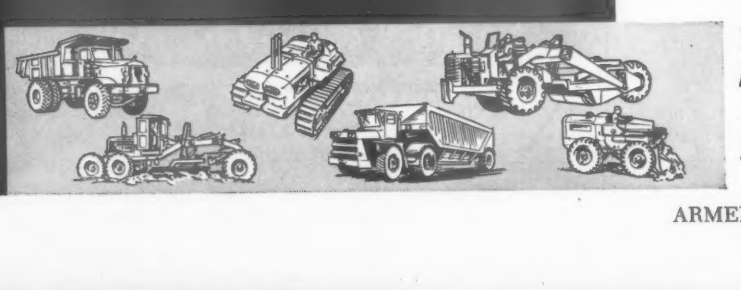

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THE MODERN DRIVE FOR MODERN EQUIPMENT

some aircraft price reductions, but has not adjusted for their prices; and Army, although it has reduced prices on substantially all major end items, it has not cut those of major assemblies or repair parts.

GAO said some of the latter items are transferred at replacement costs, generally more than original purchase price. GAO also charged that in many cases incorrect or out-of-date prices for materials delivered under MAP were used.

GAO urged DOD to review pricing policies in each service, using internal audits to assure that uniform price reductions are made. The agency urged the reappraisal be made of the factors used in aircraft pricing formula. DOD was also asked to look into amounts previously reimbursed to the services in excess of that required by law.

New Communications Net Accepted by SAC

Strategic Air Command has accepted a high frequency radio communications system which insures that all SAC bombers are in continual voice contact with SAC headquarters.

Called "Short Order" the system provides SAC headquarters with instant global voice contact with over 2,000 SAC bombers when they are launched. The system enables the SAC commander to communicate with any or all SAC aircraft, location notwithstanding.

Contractor is Collins Radio Co. The system is based on single side band transmission.

The system uses a 172-foot antenna, measuring 500 feet across the center, plus other single side band transmitter and receiver antennas. Short Order has increased the power of SAC's ground-to-air communications from 500 watts to 45,000 watt capacity.

The Command Post microphone is hooked to a single side band radio transmitter site near Scribner, Neb., from which verbal messages can be sent out in all directions by a series of transmitters. Alternate transmitter sites are located at SAC's three numbered Air Force headquarters. Using these transmitters and any one of several radio frequencies, the SAC commander can communicate to the entire SAC bomber force.

Army Shopping List Detailed for Congress

A detailed breakdown of Army's $1.524-billion request for new obligational authority for procurement of equipment and missiles has been presented to the Senate Defense Appropriations Subcommittee. Both aircraft and missiles play a heavy part in Army's spending plans for this year.

Army is asking Congress for $38.4-million for 118 Iroquois helicopters according to Lt. Gen. Robert W. Colglazier, Jr., Deputy Chief of Staff, Logistics. Colglaizer also said Army wanted $11.4-million for the Redeye missile.

He said Army would buy 1700 of these self-contained light-weight shoulder-fired missiles. Using infrared techniques, Redeye is designed for front-line troop defense against low-flying aircraft.

Colglazier said Army wants $45.3-million for Pershing missile training equipment, preproduction engineering and limited production of ground training equipment. The missile is transportable by C-123s.

Other Army requests included: $6.6-million for six systems of USD-2 short-range surveillance drones; $8.1-million for 54 integrated Doppler navigators; and other equipment. The USD-2 drone systems each carry ten 350 mph drones, two launchers and photographic and infrared sensors.

In breaking down its total presentation Army said it needed: $877-million for fire power; $331-million for mobility; $169-million for communications; and $147-million for logistics support.

Congressional Report Warns of Oversupply

Unless Defense Department begins correlating weapon system requirements more closely with military need, contractors will generate tremendous stores of supplies for surplus material, a congressional report has warned.

The report, analyzing economic aspects of military buying and supply, was released by a Joint Economic Committee under Sen. Paul Douglas (D-Ill.).

The report is now in the hands of the Office of the Assistant Secretary of Defense for Supply and Logistics, where it is under consideration "in some detail."

Criticized were defense surplus material volumes being sold on the open market for under 2% of cost. Of $41.1-billion of stocks of all types in the military system on June 30, 1959, "some $14.3-billion . . . were in excess of the needs of the military to perform its peacetime function or for its mobilization reserve."

Acknowledging that weapon system buying is in its early development stages, the report said "supplies which traditionally have been furnished through the military procurement and distribution systems are, under some weapon system arrangements, now supplied by contractors.

"This development is bound to have a disturbing influence on existing Defense Department supply systems, particularly such measures as single procurement arrangements, standardization, utilization and other supply management improvements now being challenged by the concept."

The Joint Committee said each service now goes its "separate way" in pursuing weapon system concept, without published guidelines. Unless the program is closely analyzed and brought into line with defense supply work, "tremendous quantities of supplies" will be generated for surplus disposal by weapon system contractors."

Fast Payments Urged Under ASPR Revision

Prompt progress payments for subcontractors, particularly small businesses, will be encouraged under a change in Appendix E of Armed Services Procurement Regulation to be issued as this issue goes to press. Revision 53 will become effective 1 July this year.

Under the revision, progress pay-


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ments will no longer be optional for the prime contractor. They will be specified in a standard clause governing progress payments in all contracts. Billings will be paid not later than "a reasonable time" after payment of such amounts by government to prime.

Progress payments will be continued optionally for large subcontractors, where six months or more elapses between start of work and first delivery.

The new provisions also stress that a small contractor's need for prompt payments shall not be a handicap in his bidding for contracts. Revision 53, ASPR is available from Superintendent of Documents, U.S. Printing Office, Washington 25, D.C.

AF Defines GSE For Cost Purposes

Missile ground support equipment costs are not as high as unsupported figures would indicate, according to a recent report by an Air Force Spares Study Group. The report says true GSE makes up only about 20% of dollars invested in the ground equipment, with the balance being facility type items or ground operating equipment.

Under the new definition, only truck and ground handling equipment, maintenance platforms and test equipment constitute true GSE. Such items as launch control trailers, electrical equipment trailers, and hydro-pneumatic trailers for Thor are now defined as ground operating equipment.

Under the facility type category are such items as fuel pipelines, diesel generators, launch mounts, missile shelters, LOX tanks and pipelines, and nitrogen storage tubes.

This means that in the case of Thor, what is considered true GSE cost $33-million, with facilities and ground operating type equipment costing an added $134-million.

Having defined GSE, Air Force wants to improve its management techniques in computing spares allowances and keep its inventories as low as possible. In doing this, AF will use the so-called Hi-Valu technique.

In setting this up, first job will be to group items for selective management, then to decide the greatest areas of dollar concentration where spares allowances must be kept at lowest possible levels.

Air Force O&M Costs Up, Trouble on Hill Possible

Operation and maintenance functions for the Air Force are $107-million more for fiscal 1961 than in fiscal 1960. Maj. Gen. Robert J. Friedman has told the Senate that total O&M tag this year is $4.282-billion.

This raise in price may bring to a head an old and continuing issue on Air Force maintenance policy. Congressmen have questioned how much work should go to Air Materiel Areas, how much should go to manufacturers, and what share should be given to maintenance shops. Cuts in Air Force inventories and weapon complexity has caused the problem, and criticism leveled at it, to grow progressively worse.

Among the factors running up Air Force O&M costs are two new, highly classified projects, Blue Grass ($5.8-million) and Rag Mop ($1.7-million). Also contributing to the rise of the request has been expanded air defense and warning system, including SAGE, DEWLINE and BMEWS.

Missile support will climb $21.6-million, and support of higher performance aircraft will claim an additional $50.8-million.

Offsetting the rises are cuts in flying hours from 6.4-million last year to 5.7-million this year, along with a $72.8-million reduction in Air Force structure and aircraft inventory reductions. Also, personnel costs for the Air Force will drop $36.4-million this year.

Contract Management Centralized by AF

Air Force will consolidate its contract management work into three regions, effective during the first quarter of FY 1961, Air Materiel Command has announced.

The three contract control areas will be located at Wright-Patterson AFB, Ohio; Middletown Air Materiel Area, Pa.; and Mira Loma Air Force Station, Calif. By geographical determination, all air procurement districts, plant representatives and test site offices will fall under the regions.

Reduction from eight to three management offices is to provide more flexible operations, reduced costs, and concentration of skills. Each area will work under the direction of AMC Headquarters. Their responsibilities will include contract surveillance, production, industrial property control, flight tests, readjustment, quality control, transportation, accounting and finance, and legal and inspection functions relating to Air Force and other contracts issued by other government agencies.

Production, quality control, and other staff functions will fall to each regional chief, who will have about 250 people in his offices. Contract administration responsibilities will still fall to Air Procurement districts.

A Tracking Center collects, evaluates and displays pertinent information on all air activities within its area of responsibility. Each tracking site can track while scanning many high speed maneuvering targets. Position information and supplementary intelligence is available for insertion into the system from the communications network which involves all stations in the system.

The Control Function results in accomplishment of tactical air missions assigned by the command center, including intercepting air targets, air attacks on ground targets, return-to-base missions and response to emergency situations. The vectoring computer group calculates optimum intercept vectors, and guides the assigned aircraft to the target, constantly correcting for target maneuvers and drift. One air controller can monitor many air missions, providing a greatly expanded capacity over manual systems.

Communication is accomplished in ground-to-air messages by automatic voice or digital techniques. Microwaves, tropospheric scatter or land line communication is used between sites. Compact message structure and efficiently programmed time-sharing insures rapid updating of a maximum number of targets. Communication facilities are flexible and can easily be reorganized to accommodate a change in the number of sites.

From the REMINGTON RAND UNIVAC

Military Division

TACS—*combining data processing, communications and control functions—demonstrates total systems capabilities.*

A significant example of the capabilities of the Remington Rand Univac Military Division is the AN/TSQ-13 Tactical Air Control System. This USAF System automatically performs air surveillance, evaluation and control functions in a 160,000 square mile area, reassessing the air situation every 30 seconds to facilitate command decisions.

The transportability of the System allows Control and Reporting Centers to be quickly moved into far forward positions to give surveillance of tactical territory. A communications network, involving both voice and digital techniques, coordinates these functions with weapon groups and other military activities to successfully meet the fast-changing needs of the tactical air situation.

Designed and built by the Military Division, the Tactical Air Control System fully integrates the computation, communication and control functions. The System represents a solution to a complex problem and exhibits the characteristics which have become identified with Remington Rand Univac achievements in the military area—compact size, high speed of operation and reliability under demanding environmental conditions.

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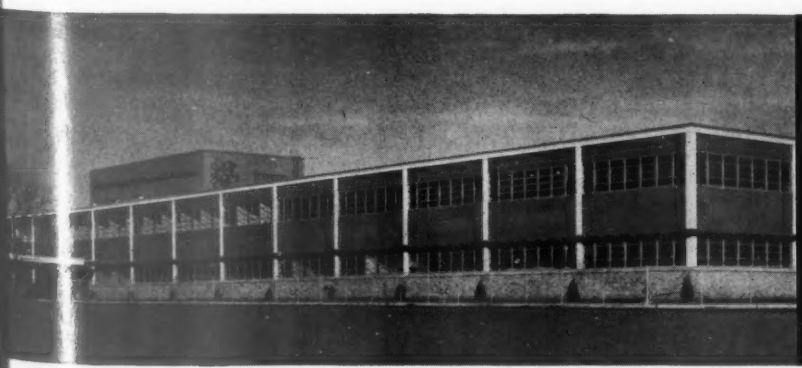

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Other control and data systems developed by the Remington Rand Univac Military Division include:

ATHENA, the Ground Guidance Computer for the U.S. Air Force ICBM TITAN.

BOMARC Computer for the U. S. Air Force Target Intercept Program.

SEA SURVEILLANCE SYSTEM FOR THE U. S. NAVY

AN/USQ-20 (Advanced Computer for the U. S. Navy).

Additional information describing capabilities and experience or career opportunities may be obtained by writing to Remington Rand Univac at the above address.

Newsletter

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National President: Hon. George H. Roderick **Exec. Vice Pres.: VAdm. Harry E. Sears, USN, ret.**

Membership Promotion

The Delinquent Member: Your National Headquarters has been very busy in the past few months eliminating deficiencies standing in the way of optimum service to you, the membership. We feel that we have accomplished everything possible at our end. Membership records are now in a new system, are in excellent condition, and complete information concerning any member is instantly available. AFM magazine is being received regularly by all the membership. There is only one remaining area of difficulty in our membership service—and here is where you can help! *Renew promptly.* When you receive your renewal notice from your chapter secretary—or from National Headquarters in the case of members-at-large—fill in your form, write out your check, and mail them pronto! This assist on your part will reduce the load on many people immensely, and can only result in better service all around. It's a sign of good personal management, too, to attend to these matters promptly! Get behind this important effort and give it a big boost. You'll have a lot more friends if you do!

In this connection:—every effort is made to avoid dropping members who, by reason of transfer or other unavoidable cause, fail to renew their memberships on time. We allow a ninety day grace period for just such contingencies. This is not meant for the average member, however, who is in a position to renew his membership when due, or preferably ahead of time. Unfortunately, we have a number of members in stable positions who are delinquent—and it is to them that we are appealing. It is with the greatest of reluctance that we put that red "DROP" beside a member's name, and notify AFM magazine to stop his subscription. And with a new issue of *The Journal* right off the press, our hands are tied in the matter of mailing this fine edition out to delinquent members. Renew that overdue membership now, and receive *The Journal* while it lasts.

Chapter Briefs

All AFMA chapters and members are reminded that the 1960 Armed Forces Day will be during May 14-22, and are requested to assist local and area commanders in their programs for the period. Informational material is available at your local public information office. Chapter meetings for the month of May should emphasize the role of our Armed Forces in the Free World POWER FOR PEACE. Corporate member representatives can assist in the observance of Armed Forces Day through industry cooperation in the various events.

Atlanta Chapter planners were hosts to AFMA Executive Vice President in mid-February during a trip of the Association's director through the Southeast. All aspects of the upcoming National Conference 19-21 April were discussed, and the facilities and services of the Atlanta Biltmore Hotel, locale of the conference, were inspected.

Continuing on to Columbus, Ga., Admiral Sears addressed a large dinner meeting of the *Fort Benning Chapter* on the evening of 16 February. In his remarks the AFMA director cited the many internal and external dangers facing our country today and what AFMA members as citizens and defense managers can do to combat these perils and enhance our nation's security. The meeting also honored Lt. Col. and Mrs. Clayton Quig, and Mr. Dana Sperr, long time workers for AFMA and the Benning program, who are leaving soon for Germany and Huntsville, respectively. Lt. Col. Earl F. Cole, chapter president, presided.

Moody AFB Chapter heard Adm. Sears at a dinner meeting on 17 February at which the base commander, Col. Lester Harris and many prominent local civilians, including ex-Governor Thompson, were in attendance. Thomas Tuggle is chapter president.

Mohawk Chapter held its monthly meeting at a joint dinner gathering with the American Society of Mechanical Engineers and Professional Group of Engineering Management on 10 March. Speaker was L. R. Mobley of IBM Corporation. Mrs. Alice Lee MacHarg is president of this chapter located at Griffis AFB, N.Y.

Twenty-seven management minded military and civilian personnel at *Eielson Air Force Base* have joined AFMA as the nucleus for a chapter at this Alaska installation. Sponsors are the Commanding Officer and Deputy of the 5010th Air Base Group, Col. Stephen W. Henry, and Col. Lewis S. Beall, USAF, respectively. Active in the project have been Maj. W. H. Roderick, USAF, and William J. Quackenbush of the 5010th. Sec'y-Treas. is Capt. Donald J. Campbell, USAF. Suggested chapter name is Eielson Executive Club Chapter. Total initial membership will be about 60.

Last Call for registration and reservations for *National Conference* activities, 19-21 April, Atlanta Biltmore Hotel. Requests should be directed to Col. W. C. Howell, Fort McPherson, Ga. and checks should be included: Registration, $2.00 ($3.00 non-member); Reception evening 19th, $2.00; Awards Banquet, 20th, $5.00. Indicate if hotel reservations are required.

Chapter Box Score

A chart showing membership growth by chapters during the past year has been prepared and some interesting comparisons are available. Copies are being run for mailing to the individual chapters in order that they may see how they stand in relation to their sister units. The giants are National Capital with 250; Atlanta, 170; Atlanta General Depot, 140; Great Lakes-Chicago, 112; Wright Brothers, 107; Fort Benning, 101; Detroit, 100; Gosport, Norfolk, 95. Smaller, but vigorous chapters include New York, 77; Mohawk, 74; Aberdeen, 57; Naval Weapons plant 57; Hawaii, 48; Great Salt Lake, 47; Far East, 43. Many smaller chapters lie below the 30 mark. Chapters showing the greatest—and in some instances, startling—growth in the past year include Great Lakes, quadrupled; Atlanta General Depot, doubled; Atlanta, nearly doubled. Nice gains were also registered by National, Fort Benning, Detroit, Gosport, Mohawk, New York, Naval Weapons Plant, Far East, Aberdeen and Hawaii. Our congratulations to the many hard-working chapter officers who made this wonderful membership growth possible. Let's double again in '60!

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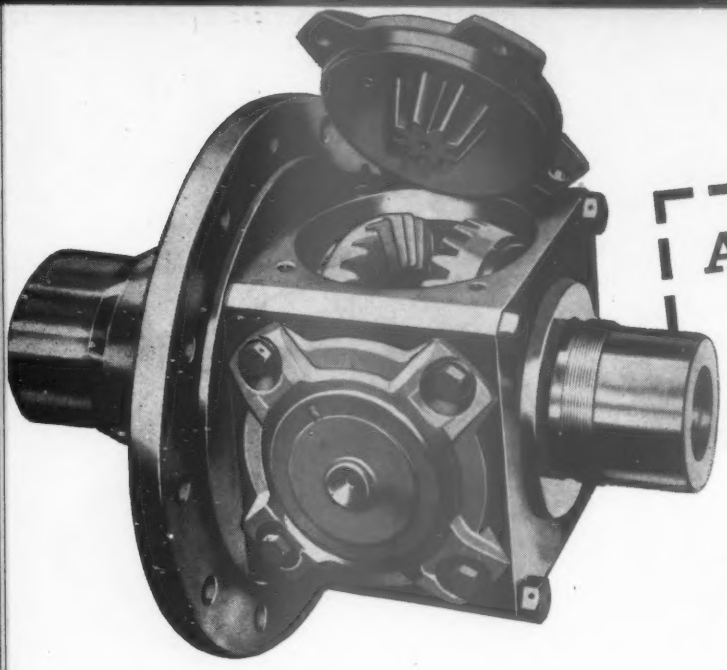

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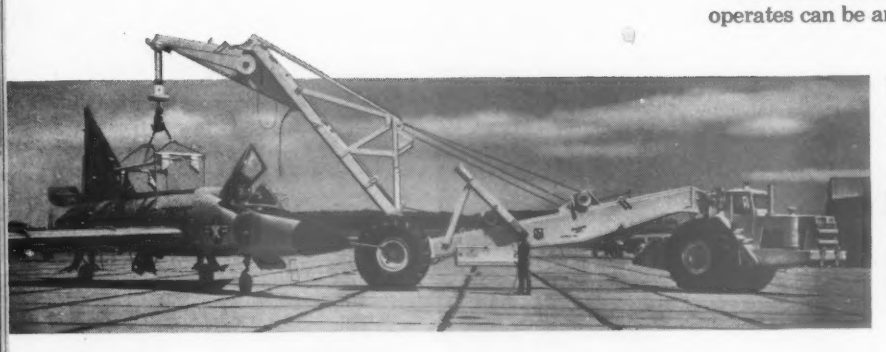

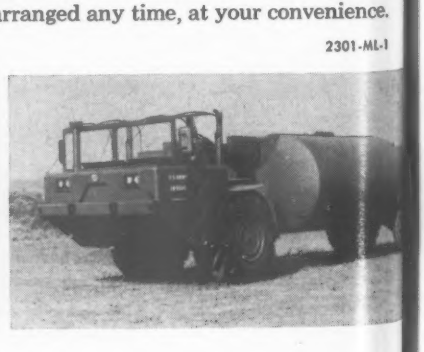

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The Third Of Fourteen Erroneous Postulates

3—Efficiency and the recognition of universal human rights are incompatible.

by Leland B. Kuhre,
Col., USA (ret.)
Founder and Director
The Academy of Organizational Science*

Proposition—The postulate is erroneous as an assumption from which to create or sustain a true organization. To demonstrate the proposition, some definitions are needed.

Definitions—The *true organization* of collective human effort is a dynamic system of relations ordering, connecting, and guiding all expected, needed, individual human contributions through a least distance into the organization's egressive production of ideas, acts, or objects to recipients for an effect.

Efficiency is "the ability to produce the effect wanted without waste of time, energy, etc." *(Thorndike-Barnhart Dictionary).*

Universal human rights in the private government of the true organization are the counterparts of those in public government. For all nations, these human rights are codified in the Universal Declaration of Human Rights by the United Nations. Man has earned these rights by becoming aware of them with an intensity strong enough to win them by force. Decisive revolts by the American and his antecedents mark the trend toward ideals.

In 1215, the revolt of the barons at Runnymede, against the personal government of King John, won the Magna Charta and government by law, not by men.

The American Revolution (1775-1783) gave all men the dignity of possessing thought and reason for self-government.

In the French Revolution (1789-1799) peasants revolted against feudalism in an agrarian civilization. Following feudalism, men had proprietary interest in their jobs; they could own, or rent, a piece of land. Then they could please the job, not the personality of a personal superior in a private government.

With the industrial civilization (c. 1800) and its new private governments, such as the factory, men had to use force again to win anew the same human rights they had already won in the agrarian civilization. This time, in the United States, the revolt took form by 1827 as the trade union movement with a public support that by 1935 had become a public law by act of Congress (NLRA). The strength of the forces involved is shown by the use of clubs, explosives, and bullets, and by a significant record of killed and wounded.

Man's own awareness of himself, as he has stated it in his dying declarations in history, claims these human rights in the private government of collective human effort: (Public government counterparts are in parentheses).

(1) To be governed primarily by his job under the law of the situation, not by pleasing the personality traits of a superior; (government by law, not by men)

(2) To function primarily in a stable system of organizational relations with impersonal equality and privacy of personality, not in a flux of superior-inferior personal relations as primary; (all men are created equal)

(3) To have his inherent possessions of thought, reason, and creativeness recognized with an expectancy of their use in his work; (man is capable of self-government)

(4) To feel an atmosphere of faith in the individual with an expectancy of good. (innocent until proven guilty)

Demonstration—When the private government of an organization for any purpose—business, government, man's betterment, military—does not recognize these human rights through its *actions* and methods, then the individual senses the denial even though he may be unaware of it as such. But when he leaves the private-government atmosphere of his bread-winning life and returns to the public-government atmosphere of his political, religious, and social life, he breathes more freely.

The antipathy of the individual is a spectrum of reactions from passive resignation and time-serving performance, through concealed resentment, absences, open conflict, and quitting, to strike and mutinies. Regardless of on-the-surface appearances, the undercurrent of discord is always running. Discord in a system wastes time and energy, and waste is inefficiency.

Conclusion—The lack of recognition of universal human rights causes inefficiency, therefore the postulate is erroneous. A rational science of organization must visualize a conceptual model of the individual in the universal organization as having four features—the four human rights—and form the organization so its structure and *modus operandi* convey to each and every person a recognition of the four features as ideals, and manage so the organization and the individual are impelled to practice the nearest right under the circumstances. In the rational science of organization, the logical deduction of a structure having in it the four human rights brings into being, concomitantly, the best structure for efficient operation and effective results.

*Author Kuhre can be contacted at 203 Greenlawn Dr., San Antonio 1, Tex.

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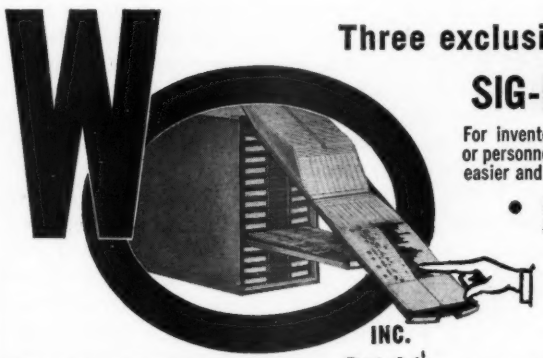

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NEWS: MAN BITES STOCK TABLES

The old advertising slogan "We do the difficult immediately, but the impossible takes a little longer" might well have been coined to describe American newspapers and press services.

The stock tables provide a vivid example of the speed and accuracy with which the press gathers and publishes the news every day. In many cities, people on their way home from work can pick up an afternoon paper containing final prices from the country's principal stock markets. This is an important service to investors, but it's quite a publishing feat too. The New York Stock Exchange, for example, doesn't close until 3:30 p.m. eastern time.

It may be that some readers consider these "long rows of numbers" both difficult and dull. Well, they aren't, far from it. Once you get the hang of the necessary abbreviations, they're a snap to interpret. And what's more, they are interesting and important—since the price fluctuations reflex the feelings of investors all over America.

Let's take a look at some typical data about a mythical company which might appear in the New York Stock Exchange tables in papers across the land: (The number of stock prices reported and the number of items covered for each stock vary in different papers.)

—1960— High	Low	Stock and Div in Dollars	Sales 100s	First	High	Low	Last	Net chge.
571/8	*391/2*	*El Op 1.60 a*	*219*	*531/8*	*541/8*	*521/2*	*531/2*	*up 3/8*

"El Op" refers to the company's name, Electro Operations Inc. The 1960 High and Low mean that at some time this year the common stock of Electro Operations sold for as high as $57.12½ and as low as $39.50. These figures enable the reader to compare each day's prices along with price movements during the year. Thus he has an important frame of reference in judging his present holdings or possible future investments.

Next is the name of the stock, generally followed by information as to the company's dividend payments during the previous twelve-month period. In this instance, Electro Operations has paid $1.60 per share, or 40 cents each quarter. The "a" following the $1.60 refers the reader to a footnote indicating that the company also paid an extra dividend sometime during the current year.

Sales in 100s tell the reader how many shares of the stock were traded on the New York Stock Exchange that day. In this case, the total amounted to 21,900 shares, which would be fairly heavy activity. Sales are quoted in 100s because most stocks are traded in units or round lots of 100. Anything less, of course, is called an odd lot and doesn't appear on the ticker.

The next four figures, all calibrated in dollars, give the opening price at which the stock traded, followed by the high and low for the day, and the closing price The movements of Electro during the trading day reflect the sort of fluctuations that can generally be expected of an active stock on a major exchange.

The last column gives the net change from the previous day's close: the price of Electro Operations went up 37½ cents that day. If you happen to own shares of Electro, this last column illuminates the value of your holdings as of the close of the day's trading.

And if you do happen to own stocks, you don't have to be told that it's important to look at the stock tables on a regular basis. Even if you're not a shareowner, a good nodding acquaintance with the stock tables will come in handy if and when you decide to invest. With some 12.5 million Americans already in the shareowner family, it may not be long before you too join them.

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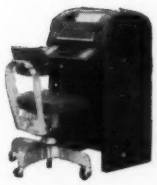

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In My Opinion

National Suicide?

Thank you for . . . sending me the advance tear sheet of the article "Today's Military Strategy: Is It National Suicide?" I enjoyed reading it.

The Air Force is continually looking at all aspects of our Defense posture and articles of this nature serve to stimulate thorough discussions of the various aspects of these important questions.

Dudley C. Sharp
Secretary of the Air Force

Thank you for sending me advance tear sheets of your article "Today's Military Strategy: Is It National Suicide?" which I read with interest.

I noted your reference to the recent term "nuclear impasse" in connection with what you call the "kill-the-people philosophy." I introduced the concept of the nuclear impasse before the New York Economic Club last January in order to denote a condition quite different from that represented by the present "nuclear stalemate." I am enclosing a copy of this talk as I thought you might be interested in my thoughts on the potential benefits of a nuclear impasse.

Gen. Thomas S. Power
Commander in Chief
Strategic Air Command

As we interpret his speech, Gen. Power agrees with most of the premises in the article, still concludes that they add up to exactly the opposite (counter-nation) answer. Right, General?—Ed.

ASW Comment

Your . . . ASW Progress Report from the March issue of ARMED FORCES MANAGEMENT has been reviewed with interest. You doubtless are aware that ASW operations are not within my sphere of influence, but the procurement of hardware and its installation and maintenance are my responsibility.

Naturally I am vitally concerned with my own part of this problem which involves deciding which improvements can be installed with the money available, buying the hardware and getting it installed. Perhaps an even bigger problem is keeping the equipment working after it is in a ship, and keeping the ship operating to serve as a platform for the gear once it is selected, ordered, delivered, installed and working. Keeping the equipment and the ships operating is a constant and never-ending challenge whose inherent materiel aspects are complicated by quantitative or qualitative shortages of personnel. Of course we would all like to have an ASW Fleet equipped entirely with the latest anti-submarine gear, but while developing, procuring and installing our latest models, we must continue to strive for maximum effectiveness with our present equipment. We cannot neglect the day-to-day problems of keeping what we now have operating at its peak efficiency . . .

VAdm. Ralph E. Wilson
Deputy Chief of Naval Operations
(Logistics)

Appreciation

I surely did appreciate the fine editorial you wrote in the March issue concerning the Air Force manuals. It represents one of the very best analyses of the total situation that I have seen . . .

Homer K. Hyde
San Antonio, Tex.

NATO note

. . . It is a great privilege for me to receive ARMED FORCES MANAGEMENT. I have had many occasions to become aware of its importance and it will be for me a constant satisfaction to follow the problems as they are analysed by your review.

A. de Staercke
Ambassador
Belgian Permanent Representative to the North Atlantic Council

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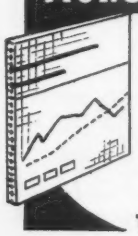

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